

TC-640A

AEP Model



SPECIFICATIONS

Power Requirements: AC 110, 127, 220, 240V
50/60 Hz, 120W

Track System: 4-track 2-channel stereo and mono

Tape: 7" (18 cm) maximum

Tape Speed: 7½ ips and 3¾ ips
(19 cm/s and 9.5 cm/s)

Recording Time: Tape Speed 4-track stereo 4-track mono
(with 1,800 ft. tape)

7½ ips (19 cm/s)	1.5 hrs	3 hrs
3¾ ips (9.5 cm/s)	3 hrs	6 hrs

Frequency Response:

NAB	Standard tape	SONY SLH tape
7½ ips (19 cm/s)	20~25,000 Hz	20~30,000 Hz
	30~20,000 Hz±3 dB	30~25,000 Hz±3 dB
3¾ ips (9.5 cm/s)	30~17,000 Hz	30~20,000 Hz
DIN	Standard tape	SONY SLH tape
7½ ips (19 cm/s)	30~20,000 Hz	30~24,000 Hz
3¾ ips (9.5 cm/s)	40~13,000 Hz	40~17,000 Hz

Signal-to-Noise Ratio: 56 dB (with SLH tape)
53 dB (with standard tape)

Wow and Flutter: DIN NAB
(RMS) weighted ±0.1% 0.07% at 19 cm/s (7½ ips)
±0.15% 0.11% at 9.5 cm/s (3¾ ips)

Recording Bias Frequency: approx. 160 kHz

Overall Distortion: less than 1.2%

Cross talk: greater than 45 dB
(between channels)

Cross talk: greater than 65 dB
(between tracks)

Erase Ratio: greater than 65 dB

Inputs: MICROPHONE × 2
Impedance: low
Maximum sensitivity: 0.19 mV (-72 dB)
LINE INPUT × 2
Impedance: 100 kΩ
Maximum sensitivity: 60 mV (-22 dB)

Outputs: LINE OUTPUT × 2
Impedance: 100 kΩ
level: 0.78V (0 dB)
HEADPHONE
Impedance: 8Ω
level: 60 mV (-22 dB)

Record Head: RF 140-2902

Playback Head: PF 140-4202

Erase Head: EF 18-2902A2

Motors: HC-634D7 (capstan)
UC-624K (reel)

Semiconductors: 29 transistors (including 2 FET) and
12 diodes

Dimensions: 14½ (W) × 15½ (H) × 9⅝ (D)
(369 × 395 × 244 mm)

Weight: 37 lb 8 oz (17 kg)

SONY®

SERVICE MANUAL

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When ordering replacement parts, use PART NUMBERS listed in Parts Lists or shown in EXPLODED VIEWS.

Parts List reference numbers should not be used.

SECTION 1 OUTLINE

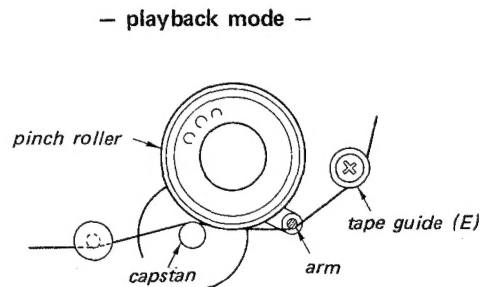
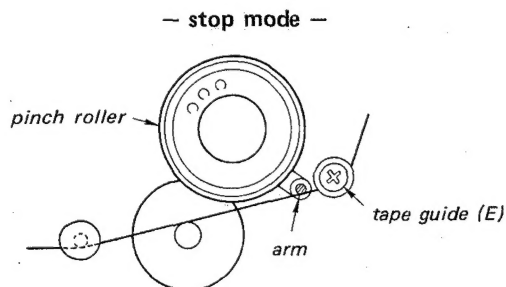
1-1. GENERAL

CAUTION

1. Do not strongly depress function levers.
2. It is normal that function lever stays locked with power switch turned OFF.

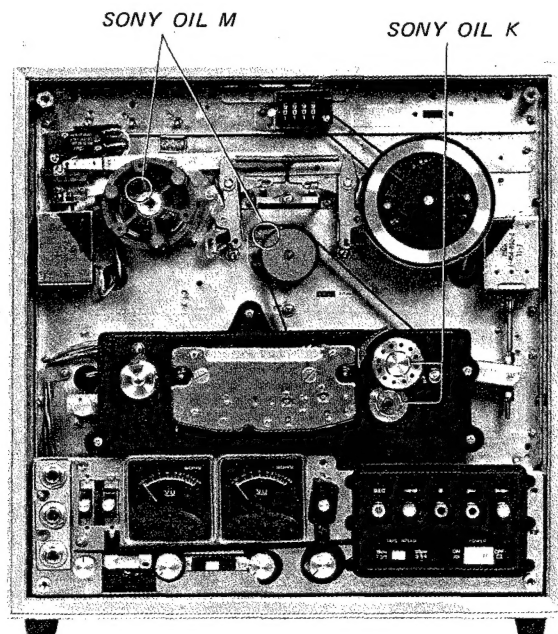
TECHNICAL FEATURE

1. Time-switch operation is available.
Locked function lever does not release with power switch turned OFF.
2. Ferrite (F & F) heads are used for all three heads.
3. Preamplifier uses FET.
4. PAUSE button can be locked.
5. Function lever directly operates motor ON/OFF switches without relay.
6. LINE OUT VOL control can attenuate LINE OUT level 20 dB.
7. MIC ATT switch is available for extremely high level input.
8. Delay switch S801 prevents brake and pinch roller solenoids from heating.
9. Arm located at pinch roller reduces tape-rubbing over pinch roller to eliminate tape squeal.



1-2. LUBRICATION

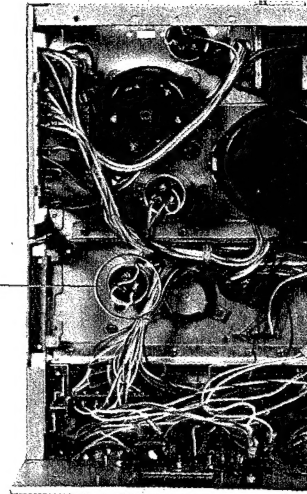
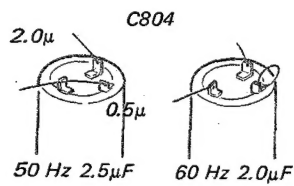
Lubricate capstan, pinch roller, capstan motor and reel motors with three drops of SONY OIL every six months.



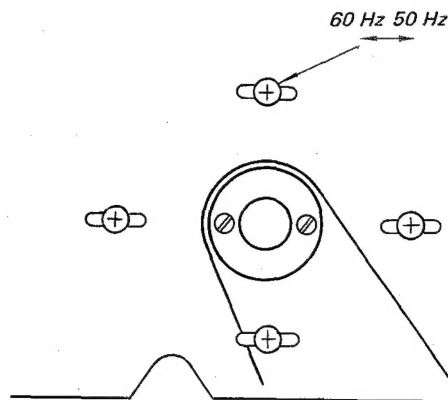
1-3. POWER FREQUENCY ADAPTATION

Perform steps 1 to 3.

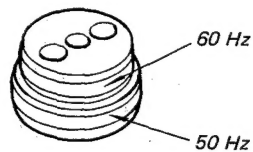
1. Change lead wire of capacitor (C804).



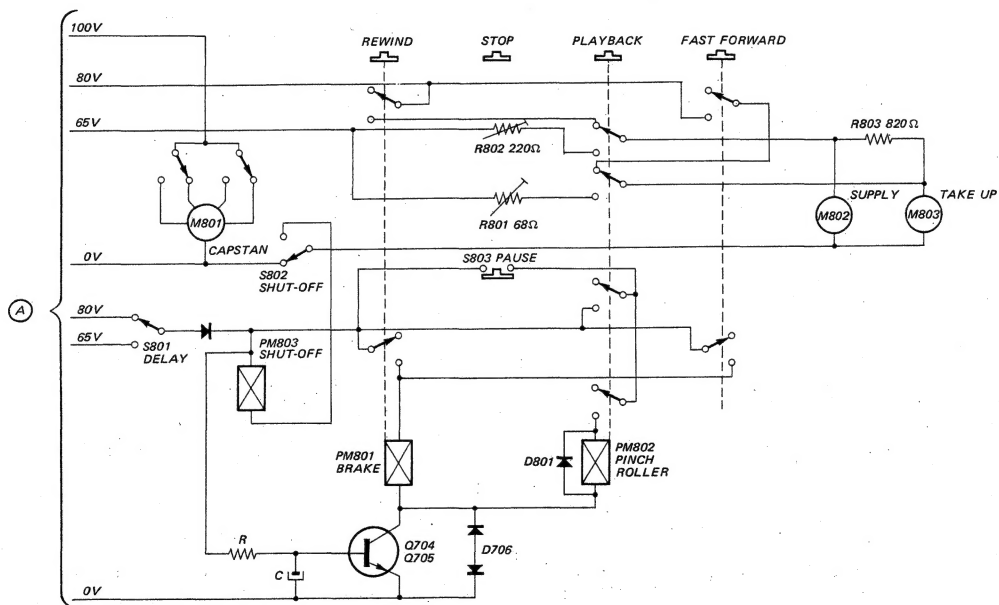
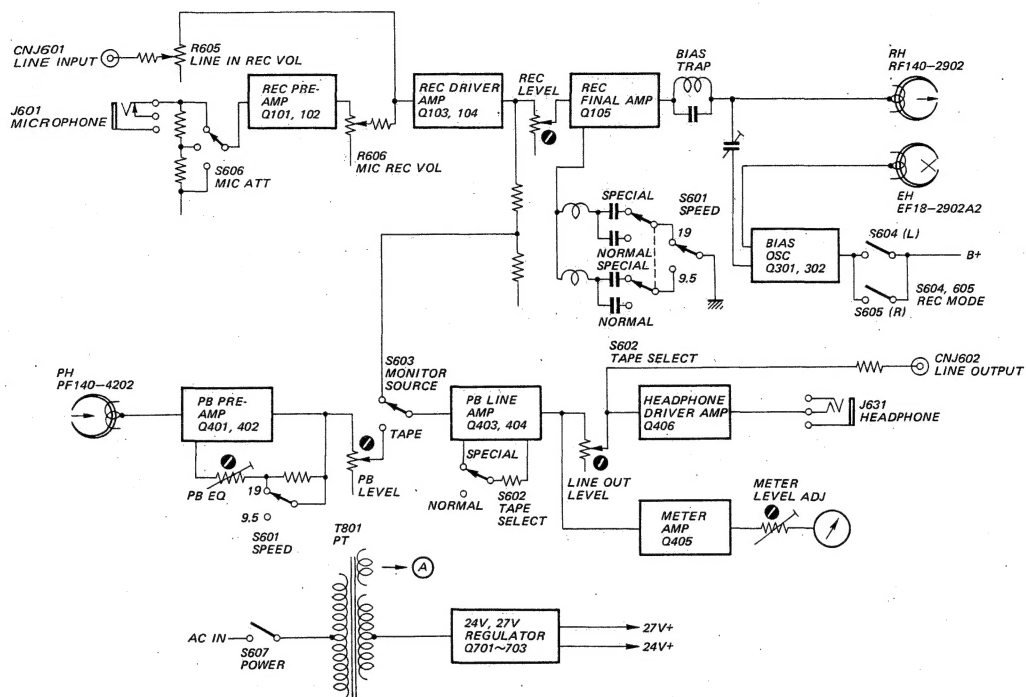
2. Change capstan motor position.



3. Change motor pulley upside down.



1-4. BLOCK DIAGRAM



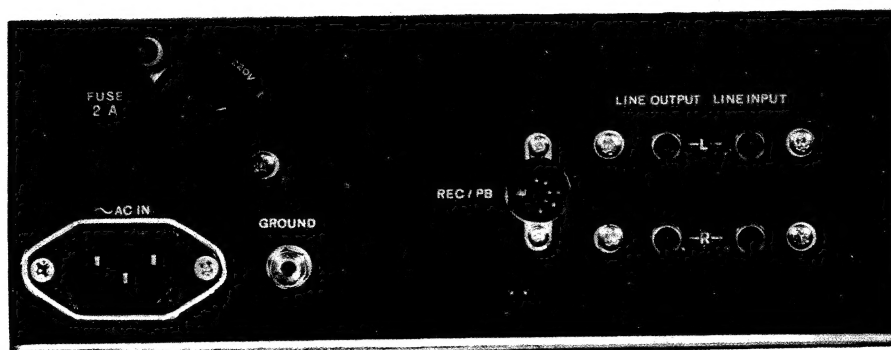
C-640A

1.5. EXTERNAL VIEWS

— Cabinet Front —



— Jack Panel —



1-6. INTERNAL VIEWS

— Chassis Front —

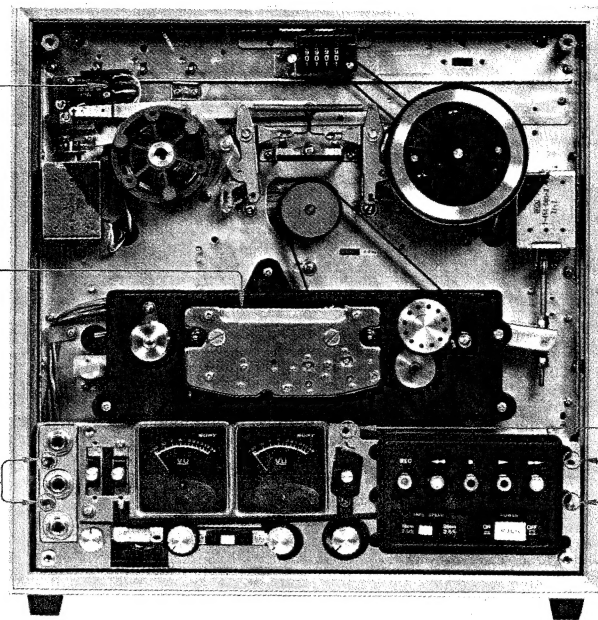
1-514-730-00
microswitch, delay (S801)

X-35315-51-1
complete circuit board,
head connector

PS 3x6

PS 3x6

PSW 3x6



Note: Remove control chassis by removing five screws.

— Chassis Rear —

X-35315-59-1
complete circuit board,
system control and power supply

1-121-004-12
capacitor, 220 μ F; 160V;
electrolytic (C801)

1-117-082-11
capacitor, 4 μ F; 250V;
metalized paper (C806)

1-117-040-22
capacitor, 2+0.5 μ F;
metalized paper (C804)

X-35315-56-1
complete circuit board,
system control switch

X-35315-58-1
complete circuit board,
record amp and bias osc

1-117-082-11
capacitor, 4 μ F; 250V
metalized paper (C805)

1-205-503-22
resistor, 68 Ω ; 40W
wire wound (R801)

1-217-175-11
resistor, 820 Ω ; 15W
wire wound (R803)

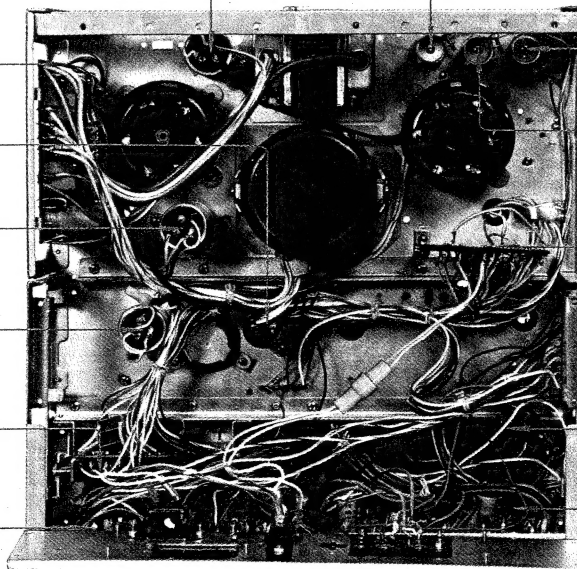
1-205-518-22
resistor, 220 Ω ; 30W
wire wound (R802)

X-35315-57-1
complete circuit board,
AC terminal

X-35315-54-1
complete circuit board,
docking

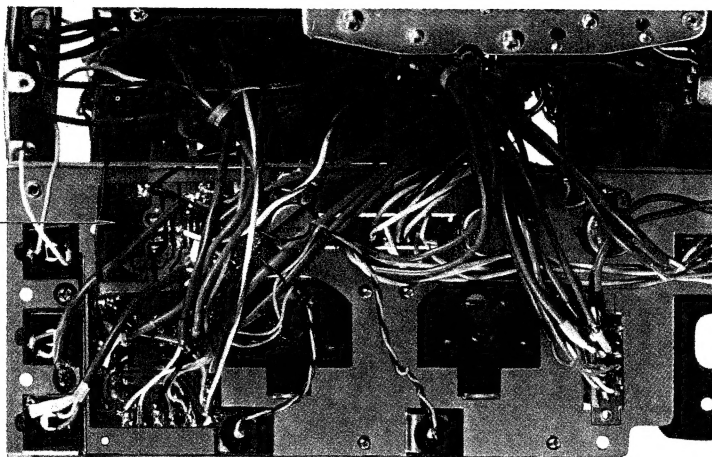
X-35315-55-1
complete circuit board,
REC MODE

X-35315-60-1
complete circuit board,
playback amp



— Amp Chassis Rear —

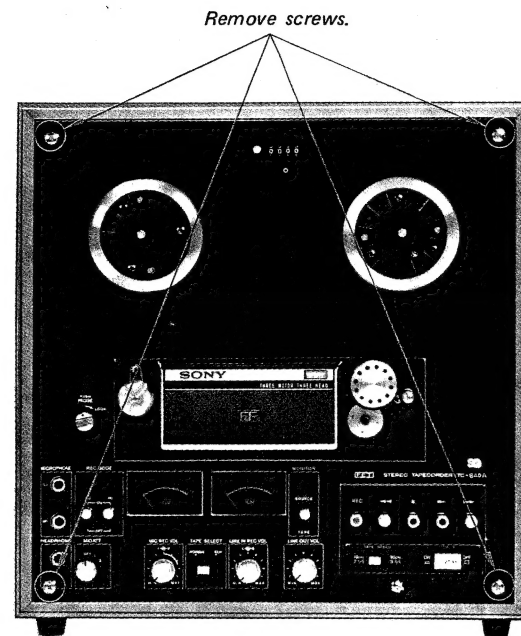
*X-35315-52-1
complete circuit board,
MIC ATT*



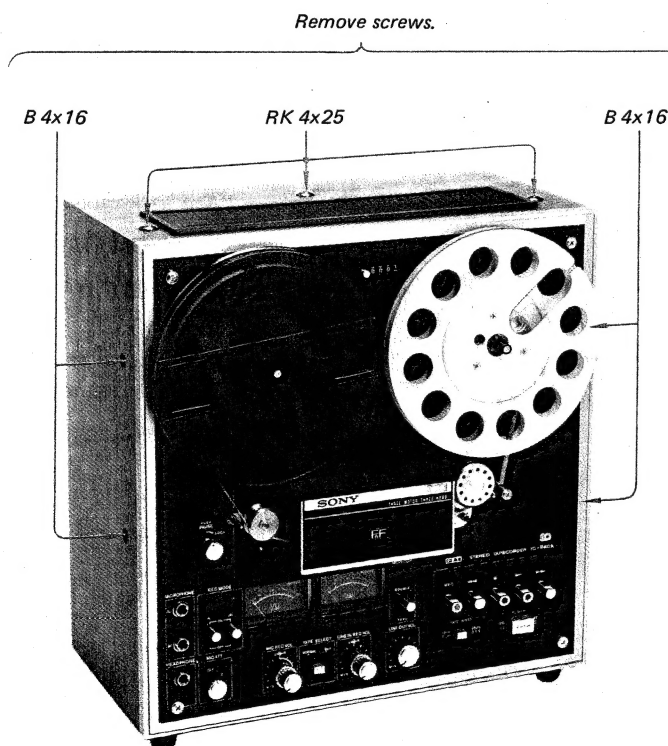
*X-35315-55-1
complete circuit board,
REC MODE*

SECTION 2 DISASSEMBLY

2.1. PANEL REMOVAL



2.2. CABINET REMOVAL



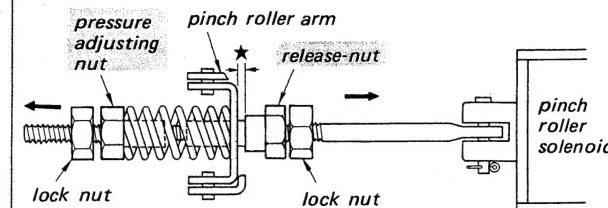
SECTION 3 ADJUSTMENTS

3.1. MECHANICAL ADJUSTMENTS

Pinch Roller Pressure Adjustment

— playback mode —

Pressure adjustment:

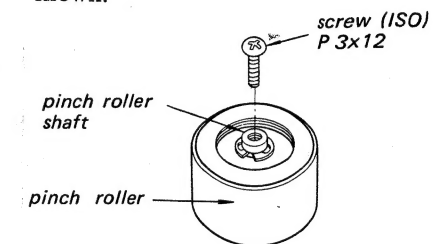


1. Melt locking compound on lock nuts with solvent.
2. Loosen lock nuts.
3. Loosen pressure adjusting nut and release-nut in the respective directions shown by arrows.
4. Place unit in playback mode.
5. Ensure that the solenoid is completely energized.
6. Adjust pressure adjusting nut for 2.2 kg (4 lb 13 oz) pressure.
7. Adjust release nut for 0.2 – 0.3 mm (10 mil) clearance shown by ★.
8. Ensure that the solenoid is completely energized with 2.2 kg (4 lb 13 oz) pinch roller pressure.
9. Tighten lock nuts and apply locking compound to the nuts.

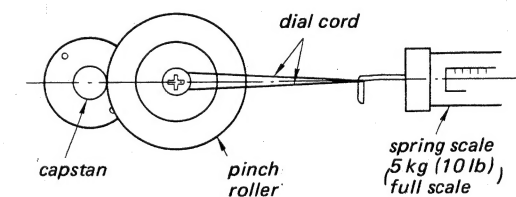
Note: Use open-end wrench for turning nut.

Pressure measurement:

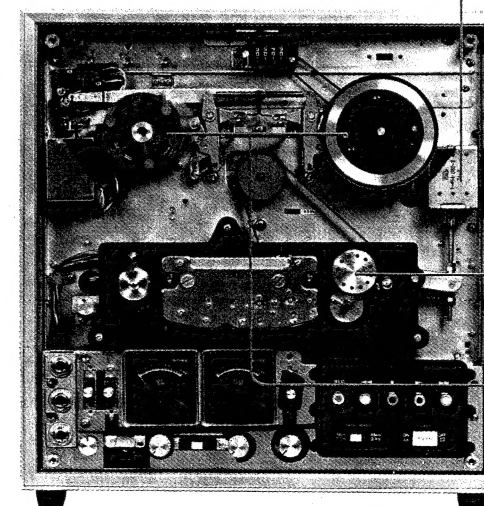
1. Remove pinch roller cap.
(Refer to pinch roller removal on page 14).
2. Attach screw to pinch roller shaft as shown.



3.

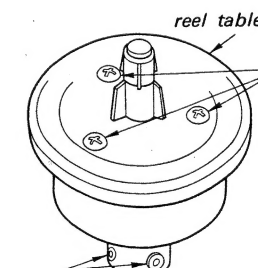


Pulling spring scale, read the scale reading just when pinch roller stops rotating.
specification: 2.2 ± 0.2 kg
(4 lb 13 oz ± 7 oz)



Reel Table Adjustment

— playback and rewind modes —

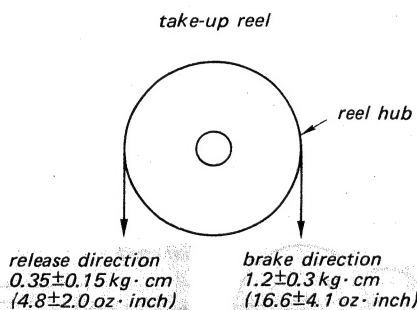
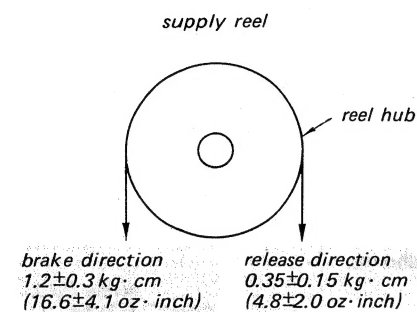


Loosen these screws and adjust reel table position so that reel table is concentric with reel shaft.

Loosen these set screws and adjust reel table height so that tape is wound at center between reel flanges.
Note: Use hex-key wrench.

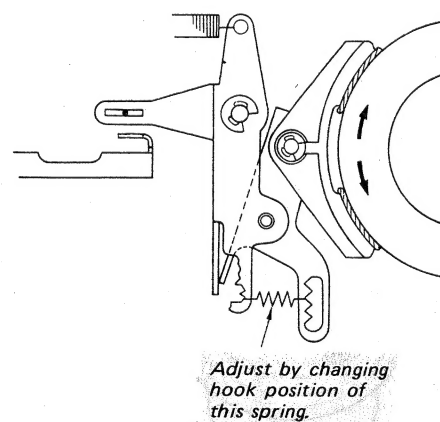
Brake Torque Measurement

— stop mode —



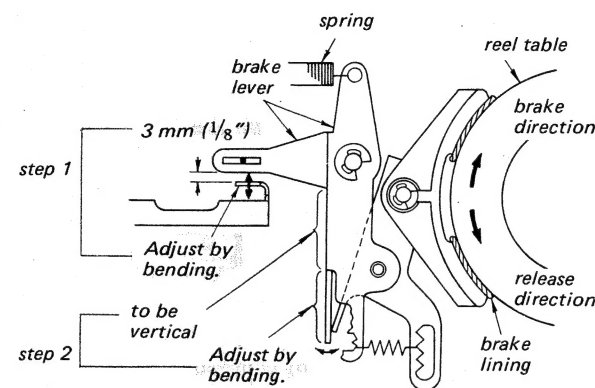
Note: When measuring torque, pull spring scale at 9.5 – 19 cm/s (3 3/4 – 7 1/2 ips) speed.

release direction torque: check only
 brake direction torque: Adjust as follows:



Brake Adjustment

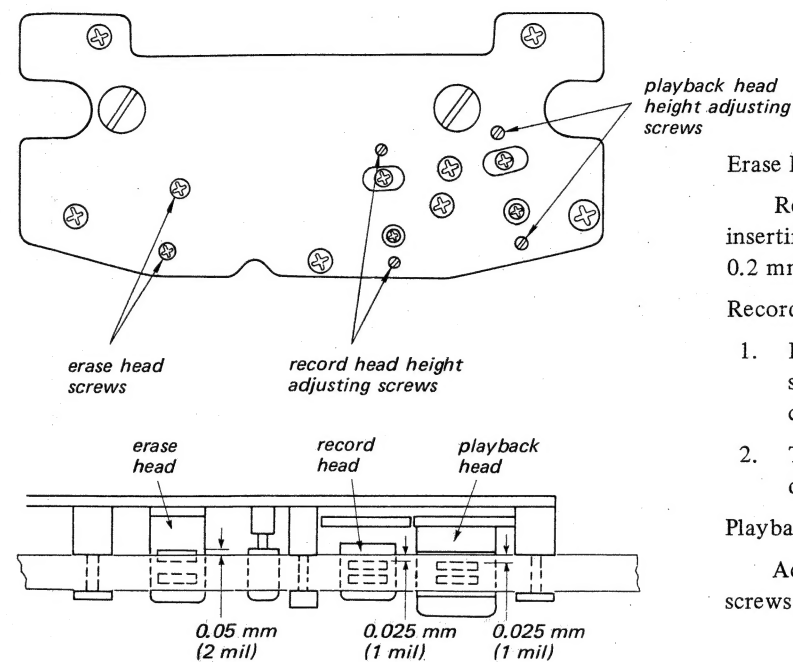
— stop mode —



Note: 1. Adjust as specified when turning reel table in release direction.
 2. When turning reel table one turn in release direction, brake lever lower tip (adjusting portion) movement should be within 2 mm (5/64"). If the movement is more than 2 mm (5/64"), reel table or brake lining is defective.

Head Height Adjustment

— playback mode —



Erase Head:

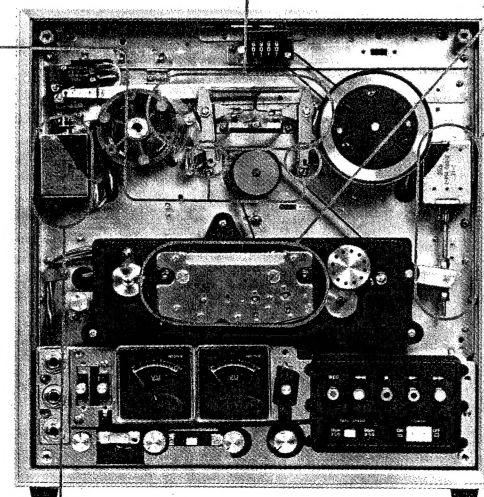
Remove erase head screws and adjust by inserting spacer (part No. 3-141-020-02, 0.2 mm t, 8 mil t)

Record head;

1. By turning record head height adjusting screws, align upper edge of record head core at upper edge of tape.
2. Turn the height adjusting screws 12 degrees clockwise.

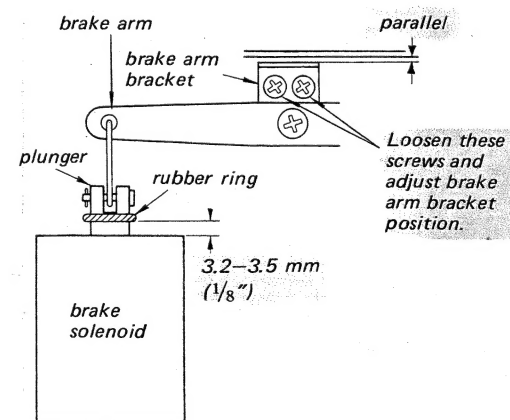
Playback Head:

Adjust playback head height adjusting screws in the same way as record head.



Brake Arm Adjustment

— stop mode —

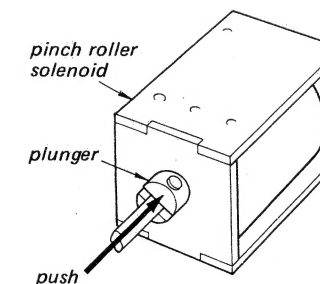


Pinch Roller Solenoid Check

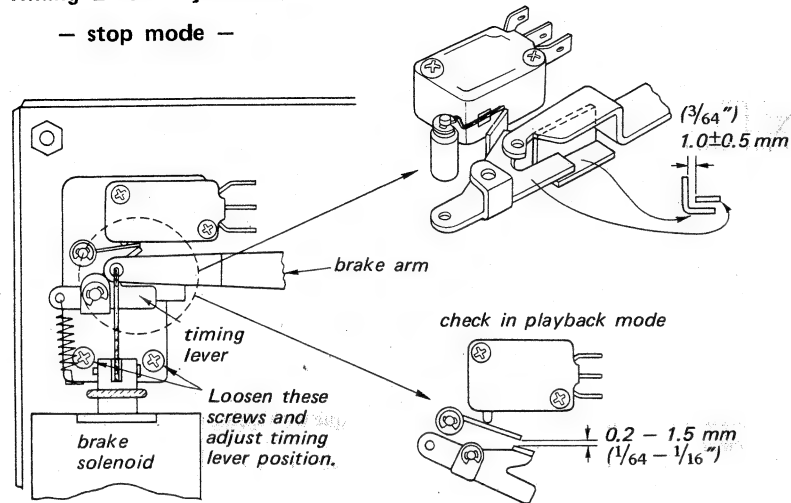
power supply voltage: 90% of rated voltage

1. Hold pinch roller by hand and place unit in playback mode.
2. Permit pinch roller to slowly approach capstan.
3. Push plunger by finger and ensure that plunger is completely inserted in solenoid.

Note: If necessary, adjust pinch roller pressure.

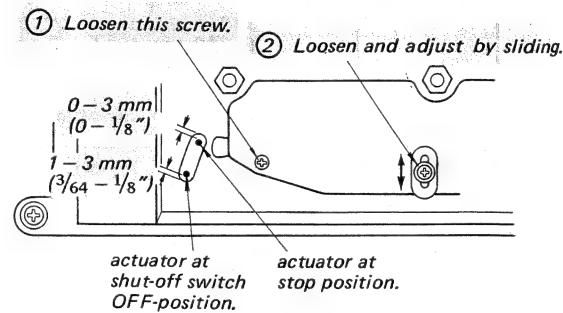


Timing Lever Adjustment — stop mode —



Shut-off Switch Actuator Adjustment — playback mode —

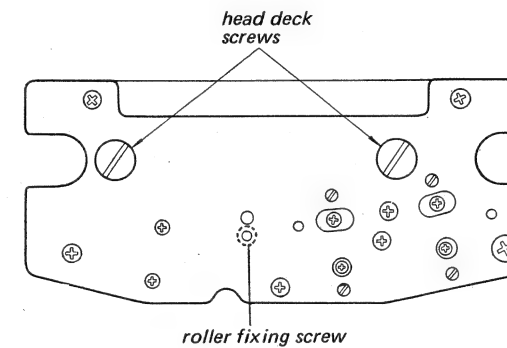
Note: 1. With head deck assembly removed, perform this adjustment.
(Refer to scrape filter roller position adjustment on page 14.)
2. After head deck assembly is installed, perform tape path adjustments on pages 13 and 14.



Scrape Filter Roller Position Adjustment — playback mode —

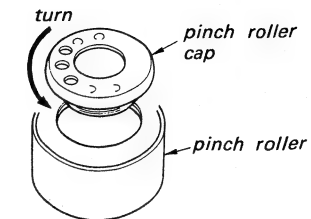
When tape does not turn scrape filter roller, perform this adjustment.

1. Remove head deck screws.
2. Remove head deck assembly.
3. Loosen roller fixing screw and position the roller forwards.
4. Fix roller fixing screw and install head deck assembly.
5. Perform Tape Path Adjustments.

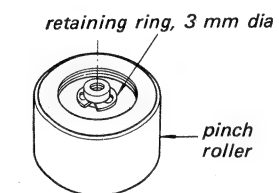


Pinch Roller Removal

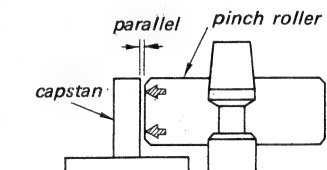
1. Remove pinch roller cap with supplied tool.



2. Remove retaining ring.

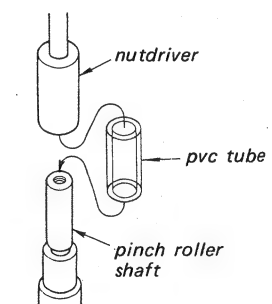


Pinch Roller Adjustment

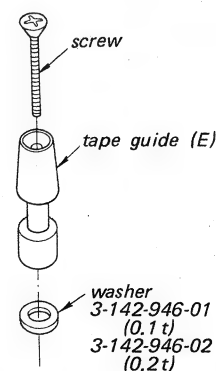


When pinch roller approaches capstan, outer surface of pinch roller should be parallel with capstan.

If necessary, with pinch roller removed, carefully adjust by bending pinch roller shaft as shown below.

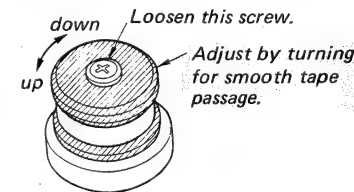


Tape Guide (E) Adjustment

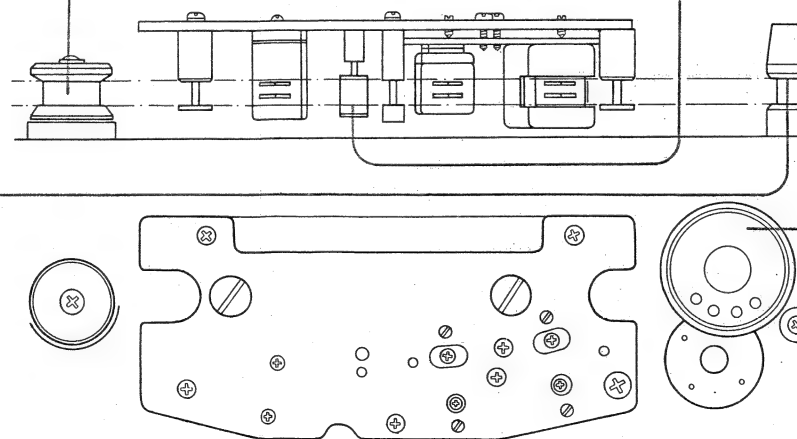


Adjust tape guide height by adding or removing washer.

Guide Roller Height Adjustment



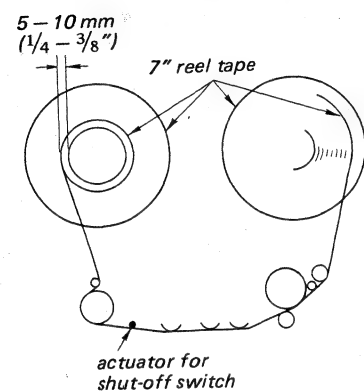
TAPE PATH ADJUSTMENTS



Tape Slack Check

— playback mode —

This check is available for timer operation.



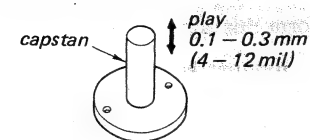
Note: Perform this check at 19 cm/s (7½ ips) tape speed in vertical operation.

1. After three-second playback operation, turn POWER switch OFF.
2. Ensure that shut-off switch is not actuated by tape slack.
3. Turn POWER switch ON.
4. Ensure that tape starts to run.
5. Repeat steps 1 to 4 a few times.

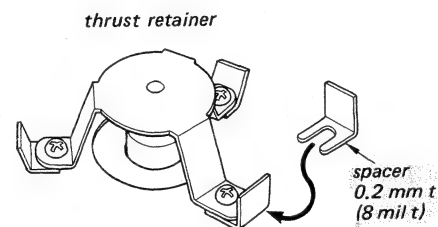
Note: If necessary, perform brake adjustment on page 11 or shut-off switch actuator adjustment on page 13.

Capstan Lengthwise Play Adjustment

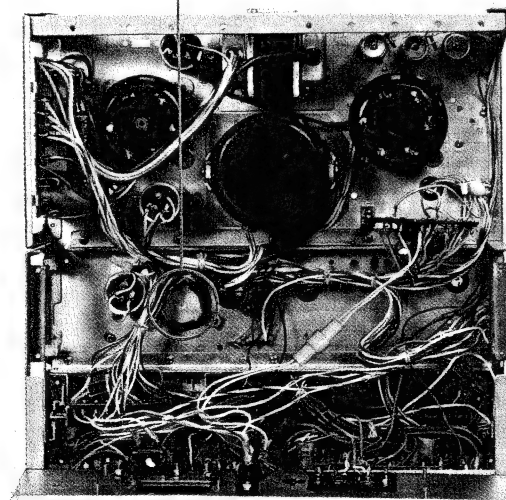
— stop mode with power switch OFF —



If necessary, adjust as follows:

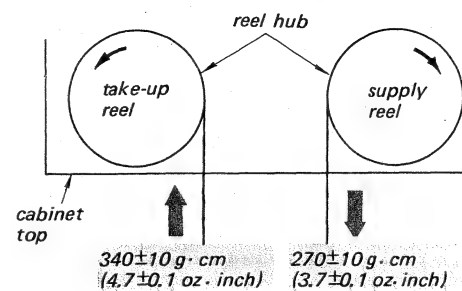


- Note:**
1. The same pieces of spacer is inserted respectively.
 2. If the play is more than 0.3 mm (12 mil) with spacers removed, the play up to 0.5 mm (20 mil) is allowable.



Reel Motor Torque Measurements

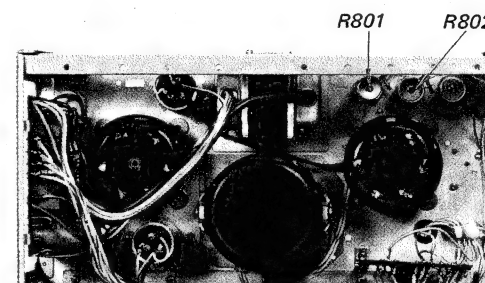
— playback mode —



Note: When measuring torque, move spring scale in arrow direction at 9.5 - 19 cm/s (3¼ - 7½ ips).

If necessary, adjust

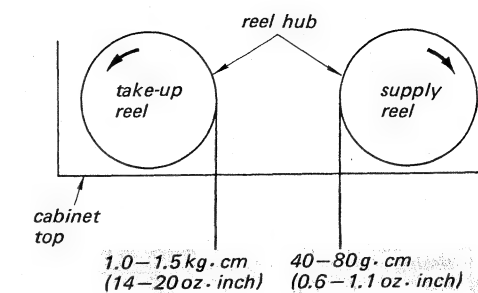
R801 for take-up torque
R802 for supply torque



CAUTION

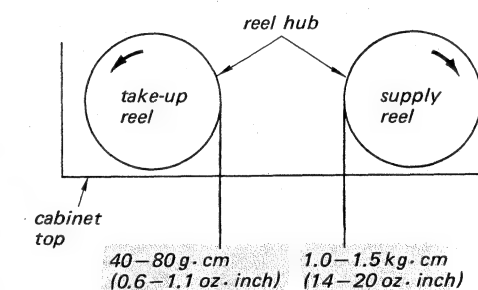
After adjustment, ensure that lead wires do not touch wirewound resistors. Wirewound resistors are heated during operation.

— fast forward mode —



Note: Measure torque with spring scale stopped.

— rewind mode —



Note: Measure torque with spring scale stopped.

3-2. ELECTRICAL ADJUSTMENTS AND MEASUREMENTS

PRECAUTION

1. Clean the following parts with an alcohol moistened swab:
 - record head
 - playback head
 - erase head
 - capstan
 - pinch roller
 - rubber belts
 - idlers
2. Demagnetize record and playback heads with a head demagnetizer. (Don't use magnetized screwdriver for adjustments).
3. After the adjustments, apply locking compound to the parts adjusted.
4. Adjustments should be performed in the order arranged in this service manual.
5. Adjustments and measurements should be performed each channel with rated voltage unless otherwise specified.
6. The adjustments and measurements require the test equipment as follows:
 - *VOM (20 k Ω /V)
 - *VTVM
 - *audio oscillator (af osc)
 - *attenuator (600 Ω)
 - *oscilloscope
 - *bandpass filter (1 kHz, 400 Hz)
 - *blank tapes NPS-1 (NORMAL)
SLH-S1 (SPECIAL)

- *digital frequency counter
- *wow meter
- *distortion meter
- *SONY test tapes

tape \ tone	1	2	3	4	5	6	7
J-9-F1 (Hz)	5k	400	400	5k	3k	200	80
(dB)	-10	0	-10	-10	-10	-10	-10
J-19-F2 (Hz)	400	400	10k	12.5k	7k	80	40
(dB)	0	-10	-10	-10	-10	-10	-10

SPC-47 (4000 Hz, 19 cm/s (7½ ips)
2000 Hz, 9.5 cm/s (3¾ ips)

WS-19-7 (3000 Hz, 19 cm/s, 7½ ips)

WS-9-7 (3000 Hz, 9.5 cm/s, 3¾ ips)

7. Rated input and output levels are as follows:

normal input level (1 kHz)

	MICROPHONE	LINE INPUT
impedance	300 Ω	10 k Ω
level	-60dB (0.78mV)	-10dB (0.25V)

normal output level (1 kHz)

	LINE OUTPUT	HEADPHONE
load resistor	100k Ω	8 Ω
level	0dB (0.78V)	-22dB (62mV)

8. Use rated power voltage for adjustments and measurements.

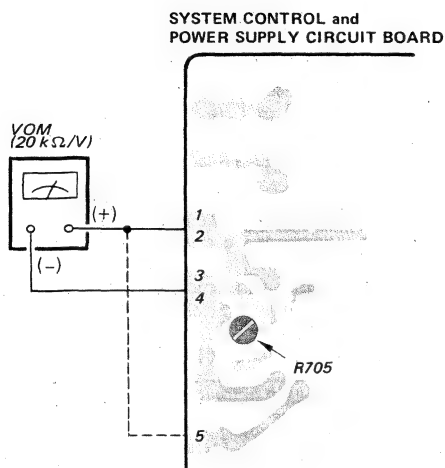
1. Power Supply Voltage Adjustment

Control/Switch Setting:

no signal input

Procedure:

1.



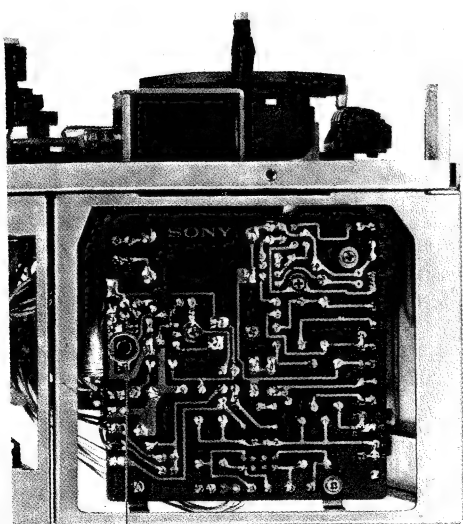
2.

	Adjust	VOM reading
terminal 1, 2	R705	26.5~27.5V

3.

Check	VOM reading
terminal 5	23~25V

Adjustment Location:



R705
SYSTEM CONTROL and
POWER SUPPLY CIRCUIT BOARD

2. Tape Speed Measurement

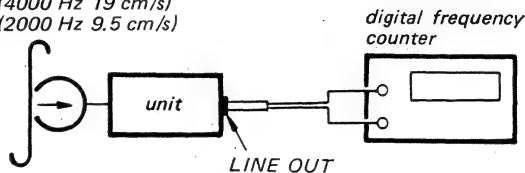
Control/Switch Setting:

MONITOR switch TAPE
TAPE SPEED switch 19 cm/s (7½ ips)
LINE OUT VOL MAX

Procedure:

1. Mode: playback

SPC-47
(4000 Hz 19 cm/s)
(2000 Hz 9.5 cm/s)



Specification:

3,960~4,040 Hz (19 cm/s, 7½ ips)
1,980~2,020 Hz (9.5 cm/s, 3¾ ips)

Note: 1. Measure beginning and end of tape.
2. Measurement should be done in ten second after tape starts to run. Measure three times and take average of them.

3. Playback Head Angle Adjustment

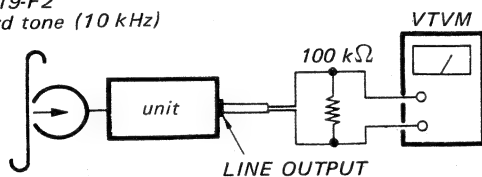
Control/Switch Setting:

MONITOR switch TAPE
 TAPE SELECT switch ... NORMAL
 TAPE SPEED switch ... 19 cm/s (7½ ips)
 LINE OUT VOL MAX

Procedure:

1. Mode: playback

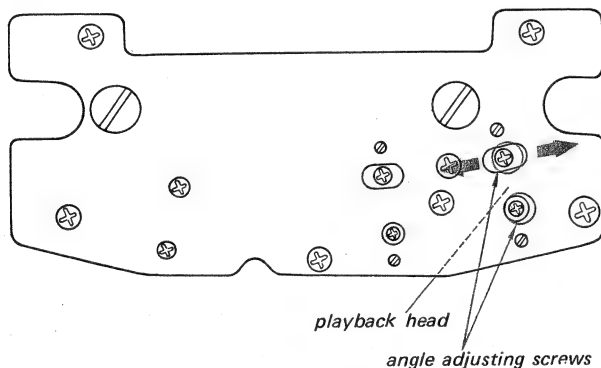
J-19-F2
 3rd tone (10 kHz)



2.

Adjust	VTVM reading
angle adjusting screws	maximum

Adjustment Location:



4. Playback Head Azimuth Adjustment

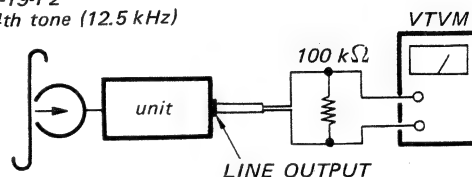
Control/Switch Setting:

MONITOR switch TAPE
 TAPE SPEED switch 19 cm/s (7½ ips)
 LINE OUT VOL MAX

Procedure:

1. Mode: playback

J-19-F2
 4th tone (12.5 kHz)

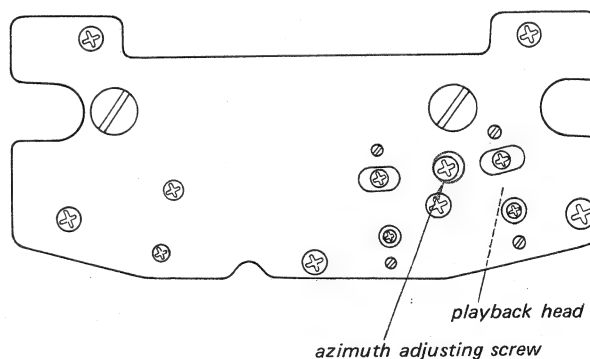


2.

Adjust	VTVM reading	Remarks
azimuth adjusting screw	biggest peak	If the azimuth angles of L-CH and R-CH are not the same, set the screw midway between two screw positions.

Note: 1. If peak level difference between L-CH and R-CH is more than 1 dB, replace playback head.
 2. When lightly touching supply reel by finger, ensure that output level does not increase more than 1 dB.

Adjustment Location:



5. Playback Phase Check

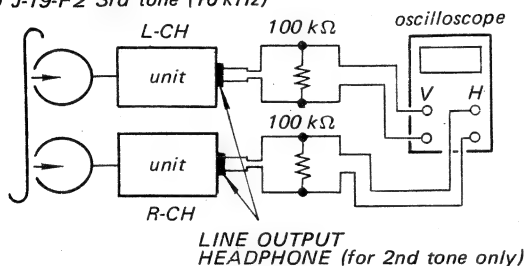
Control/Switch Setting:

MONITOR switch TAPE
TAPE SPEED switch 19 cm/s (7½ ips)
LINE OUT VOL MAX




Procedure:

1. Mode: playback

- (1) J-19-F2 2nd tone (400 Hz)
(2) J-19-F2 3rd tone (10 kHz)



- 2.

Adjust	On the oscilloscope	
azimuth adjusting screw	(1) J-19-F2 2nd tone (400Hz) (both LINE OUTPUT and HEADPHONE)	(2) J-19-F2 3rd tone (10kHz) (LINE OUTPUT only)
	 in phase	 ~  in phase 90° max
Note: If necessary, perform playback head angle and azimuth adjustment (On page 19).		

6. Playback Level Adjustment and VU Meter Calibration

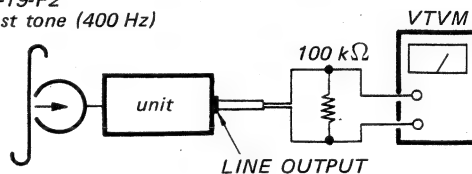
Control/Switch Setting:

MONITOR switch TAPE
TAPE SELECT switch ... NORMAL
TAPE SPEED switch 19 cm/s (7½ ips)
LINE OUT VOL MAX

Procedure:

1. Mode: playback

- J-19-F2
1st tone (400 Hz)



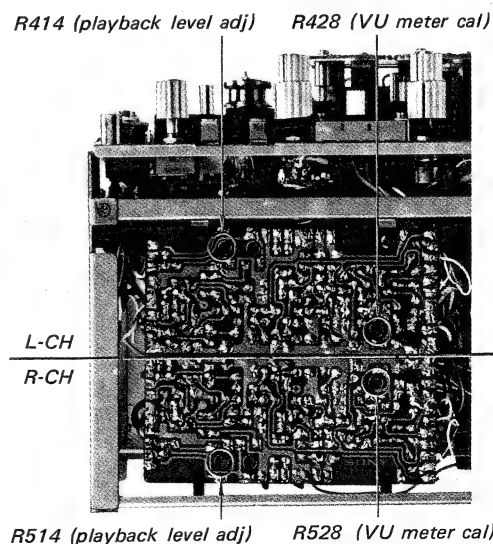
- 2.

	Adjust	VTVM reading	VU meter reading
Playback Level Adjustment	R414 (L-CH) R514 (R-CH)	0dB (0.78V)	—
VU meter calibration	R428 (L-CH) R528 (R-CH)	—	0 VU

Note: 1. Allowance: within ±1 dB.

2. Level difference between L-CH and R-CH:
within 1 dB.

Adjustment Location:



7. Playback Frequency Response Adjustment (19 cm/s, 7½ ips)

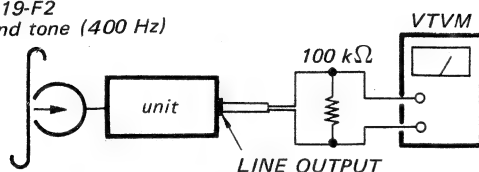
Control/Switch Setting:

MONITOR switchTAPE
TAPE SPEED switch19 cm/s (7½ ips)
LINE OUT VOLMAX

Procedure:

1. Mode: playback

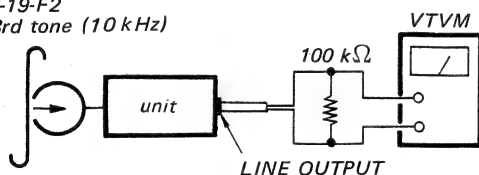
J-19-F2
2nd tone (400 Hz)



Memorize the VTVM reading.

2. Mode: playback

J-19-F2
3rd tone (10 kHz)

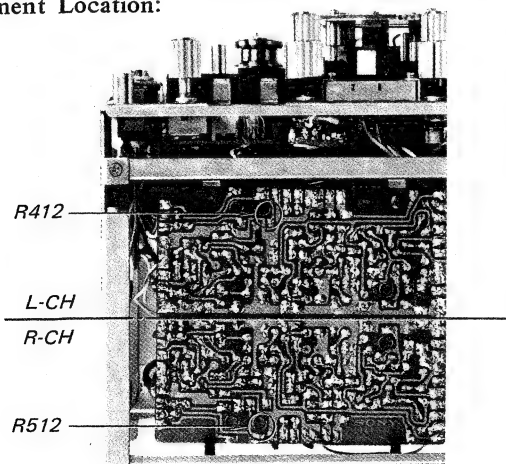


Adjust	VTVM reading
R412 (L-CH) R512 (R-CH)	the same value as in step 1

3. Play back test tape J-19-F2 and ensure that each tone output level deviation against 2nd tone is as follows.

J-19-F2	Tone			
	4	5	6	7
	12.5k	7k	80	40
Level Deviation from 2nd tone (400 Hz)	L-CH	0±2dB	0±2dB	+1.5±1.5dB
	R-CH	0±2dB	+1.5±1.5dB	+1.5±2dB

Adjustment Location:



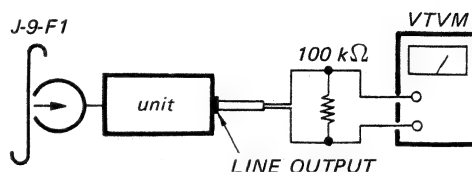
8. Playback Frequency Response Measurement (9.5 cm/s, 3¾ ips)

Control/Switch Setting:

MONITOR switchTAPE
TAPE SPEED switch9.5 cm/s (3¾ ips)
LINE OUT VOLMAX

Procedure:

1. Mode: playback



Ensure that each tone output level deviation against 3rd tone is as follows:

tone	3rd	4th	5th	6th	7th
frequency	400 Hz	5k	3k	200	80
level difference	for reference	+1.5±2dB	+1.5±1.5dB	+0.5±0.5dB	+1±2dB

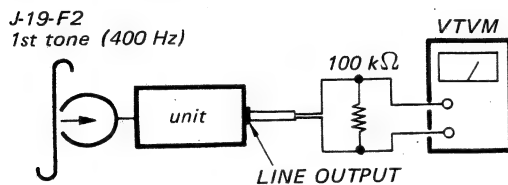
9. Playback Signal-to-Noise Ratio Measurement

Control/Switch Setting:

MONITOR switch TAPE
 TAPE SPEED switch 19 cm/s (7½ ips)
 LINE OUT VOL MAX

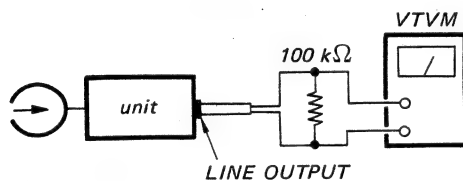
Procedure:

1. Mode: playback



Memorize the VTVM reading.

2. Mode: playback
with no tape threaded



Specification:

greater than 48 dB
 (take the lower value when changing AC
 power cord connection)

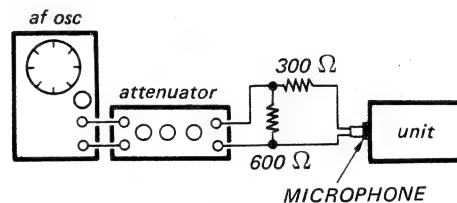
10. Minimum Input Level Measurement

Control/Switch Setting:

MONITOR switch SOURCE
 TAPE SELECT switch ... NORMAL
 REC MODE switch ON
 MIC ATT switch OFF
 TAPE SPEED switch 19 cm/s (7½ ips)
 LINE OUT VOL MAX
 MIC REC VOL MAX
 LINE IN REC VOL MAX

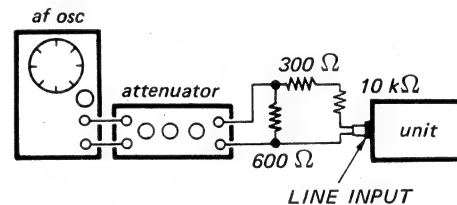
Procedure:

1. Mode: record
1 kHz, -72 dB (0.19 mV)



Ensure that VU meter reading is more than
0 VU.

2. Mode: record
1 kHz, -22 dB (62 mV)



Ensure that VU meter reading is more than
0 VU.

11. Input Level Variation Check

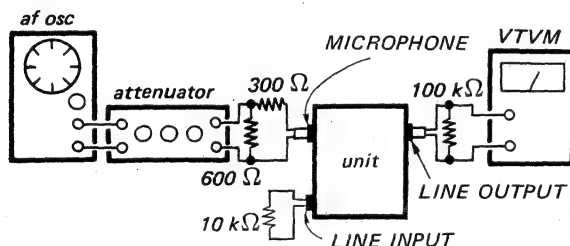
Control/Switch Setting:

MONITOR switch SOURCE
 TAPE SELECT switch..... NORMAL
 REC MODE switch ON
 MIC ATT switch OFF
 TAPE SPEED switch 19 cm/s (7½ ips)
 LINE OUT VOL MAX
 MIC REC VOL For 0 dB (0.78 V) LINE
 OUT level with 1 kHz,
 -60 dB (0.78 mV)
 MICROPHONE signal.
 LINE IN REC VOL For 0 dB (0.78 V) LINE
 OUT level with 1 kHz,
 -10 dB (0.25 V) LINE
 IN signal.

LINE IN REC VOL variation

Procedure:

1. Mode: record
1 kHz, -60 dB (0.78 mV)

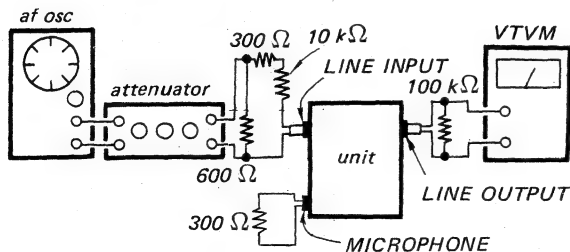


LINE IN REC VOL control	VTVM reading
MIN → MAX	less than 2 dB

MIC REC VOL variation

Procedure:

1. Mode: record
1 kHz, -10 dB (0.25V)



MIC REC VOL control	VTVM reading
MIN → MAX	less than 2 dB

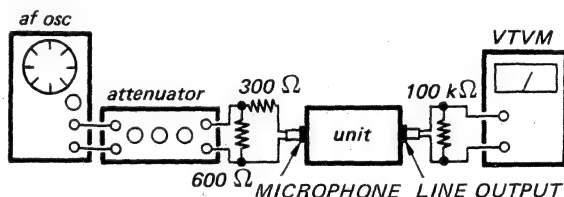
12. MIC ATT Switch Check

Control/Switch Setting:

MONITOR switch SOURCE
 TAPE SELECT switch.... NORMAL
 REC MODE switch ON
 MIC ATT switch OFF
 TAPE SPEED switch..... 19 cm/s (7½ ips)
 LINE OUT VOL MAX
 MIC REC VOL For 0 dB (0.78 V) LINE
 OUT level with 1 kHz,
 -60 dB (0.78 mV)
 MICROPHONE signal.

Procedure:

1. Mode: record
1 kHz, -60 dB (0.78 mV)



MIC ATT switch	level difference
OFF	for reference
1	-17 ~ -13 dB
2	-32 ~ -28 dB

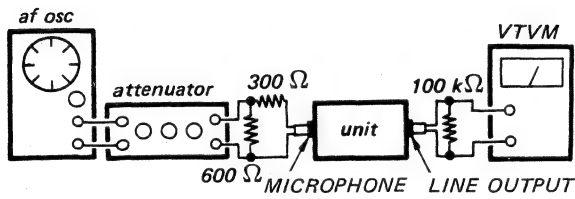
13. LINE OUT VOL Check

Control/Switch Setting:

MONITOR switch SOURCE
 TAPE SELECT switch NORMAL
 REC MODE switch ON
 MIC ATT switch OFF
 TAPE SPEED switch 19 cm/s (7½ ips)
 LINE OUT VOL MAX
 MIC REC VOL For 0 dB (0.78 V) LINE
 OUT level with 1 kHz,
 -60 dB (0.78 mV)
 MICROPHONE signal.

Procedure:

1. Mode: record
 1 kHz, -60 dB (0.78 mV)



LINE OUT VOL control	level difference	VU meter
MAX	for reference	0 VU
MIN	-33~-27dB	0 VU

Note: When turning LINE OUT VOL control from MAX to MIN, ensure that VU meter reading does not change.

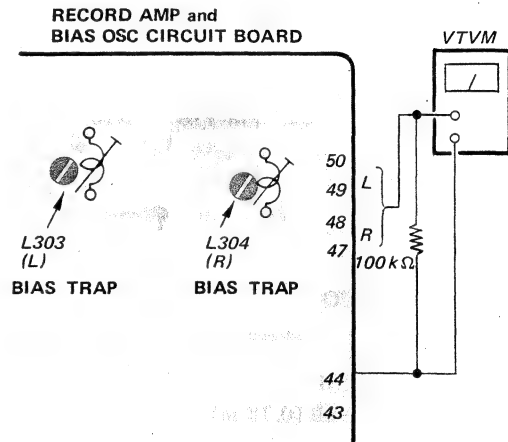
14. Bias Trap Coil Adjustment

Control/Switch Setting:

TAPE SELECT switch NORMAL
 REC MODE switch ON
 TAPE SPEED switch 19 cm/s (7½ ips)

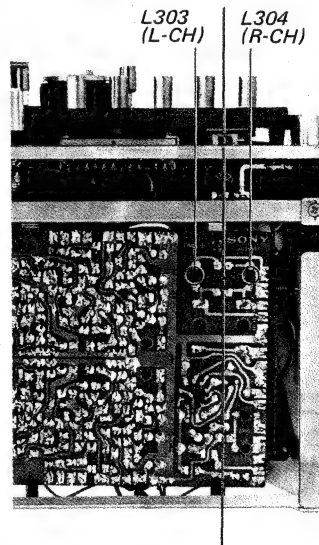
Procedure:

1. Mode: record



Adjust	VTVM reading
L303 (L-CH) L304 (R-CH)	minimum (less than -6 dB (0.38V))

Adjustment Location:



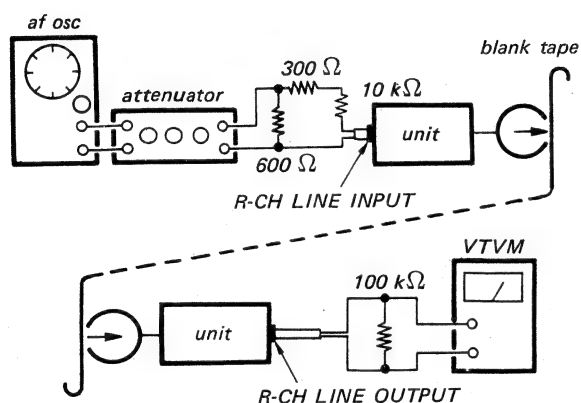
15. Record Head Height Adjustment

Control/Switch Setting:

MONITOR switch TAPE
 TAPE SELECT switch NORMAL
 REC MODE switch ON
 MIC ATT switch OFF
 TAPE SPEED switch 19 cm/s (7½ ips)
 LINE OUT VOL MAX
 LINE IN REC VOL For 0 dB (0.78 V) LINE
 OUT level with 1 kHz,
 -10 dB (0.25 V) LINE
 IN signal.

Procedure:

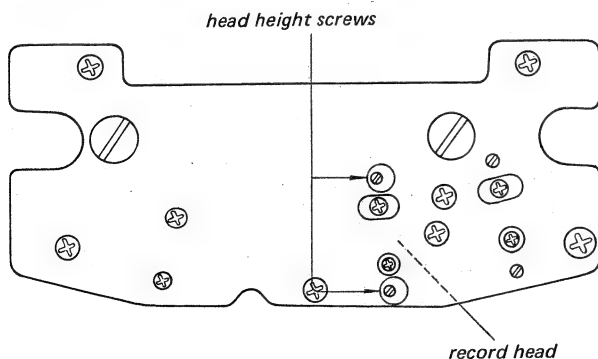
1. Mode: record
 1 kHz, -10 dB (0.25V)



Adjust	VTVM reading
record head height screws	maximum

Note: When performing this adjustment, the two screws should be turned in the same angle.

Adjustment Location:



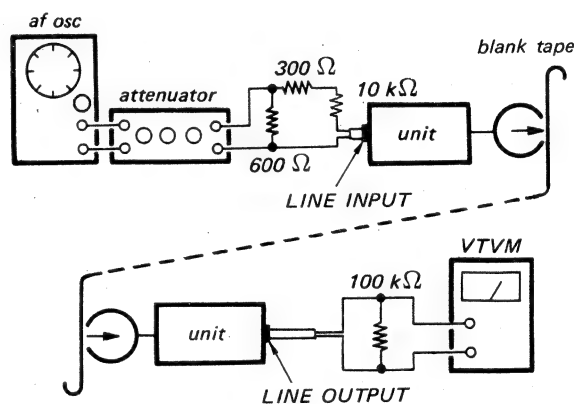
16. Record Head Angle Adjustment

Control/Switch Setting:

MONITOR switch TAPE
 TAPE SELECT switch NORMAL
 REC MODE switch ON
 MIC ATT switch OFF
 TAPE SPEED switch 19 cm/s (7½ ips)
 LINE OUT VOL MAX
 LINE IN REC VOL For 0 dB (0.78 V) LINE
 OUT level with 1 kHz,
 -10 dB (0.25 V) LINE
 IN signal.

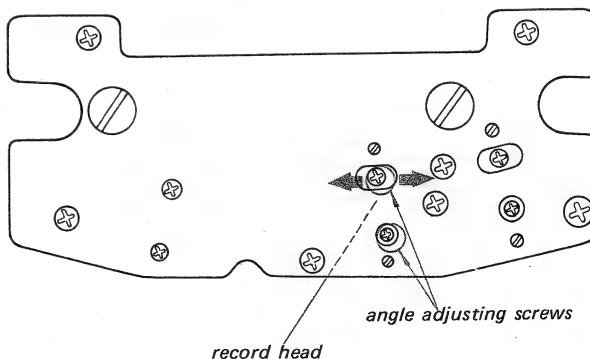
Procedure:

1. Mode: record
 10 kHz, -30 dB (24.5 mV)



Adjust	VTVM reading
angle adjusting screws	maximum

Adjustment Location:



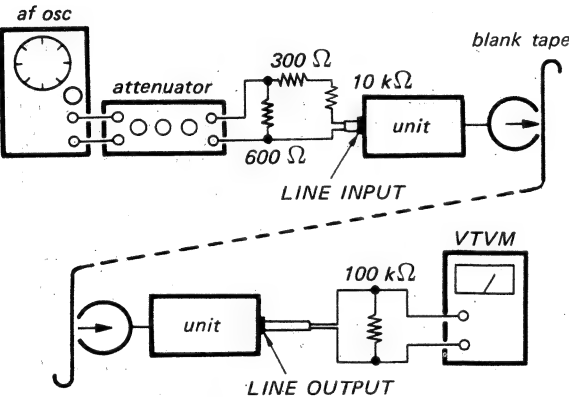
17. Record Head Azimuth Adjustment

Control/Switch Setting:

MONITOR switch TAPE
 TAPE SELECT switch NORMAL
 REC MODE switch ON
 MIC ATT switch OFF
 TAPE SPEED switch 19 cm/s (7½ ips)
 LINE OUT VOL MAX
 LINE IN REC VOL For 0 dB (0.78V)
 (MONITOR switch: SOURCE) LINE OUT level
 (LINE OUT VOL: MAX) with 1 kHz,
 -10 dB (0.25V)
 LINE IN signal.

Procedure:

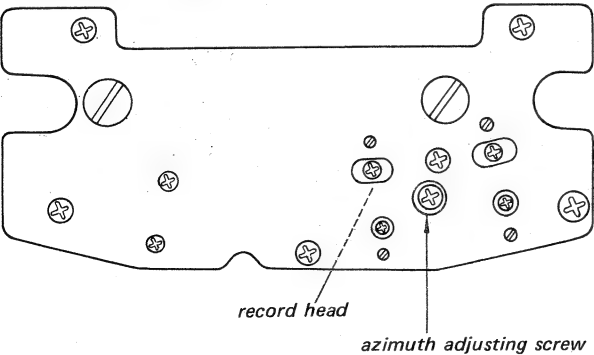
1. Mode: record
 15 kHz, -30 dB (24.5 mV)



Adjust	VTVM reading	Remarks
azimuth adjusting screw	maximum	If the azimuth angles of L-CH and R-CH are not the same, set the screw midway between two screw positions.

Note: If peak level difference between L-CH and R-CH is more than 1 dB, replace record head.

Adjustment Location:



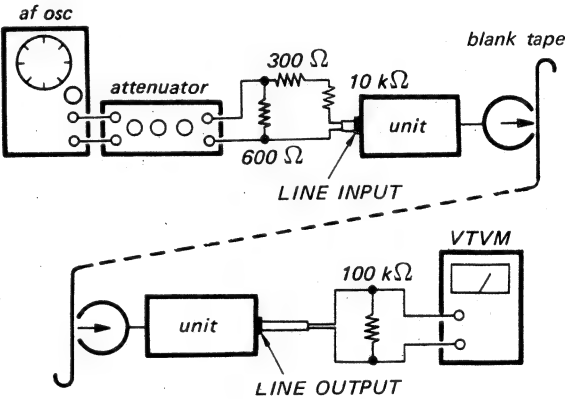
18. Bias Adjustment

Control/Switch Setting:

MONITOR switch TAPE
 TAPE SELECT switch NORMAL
 REC MODE switch ON
 MIC ATT switch: OFF
 TAPE SPEED switch 19 cm/s (7½ ips)
 LINE OUT VOL MAX
 LINE IN REC VOL For 0 dB (0.78V)
 (MONITOR switch: SOURCE) LINE OUT level
 (LINE OUT VOL: MAX) with 1 kHz,
 -10 dB (0.25V)
 LINE IN signal.

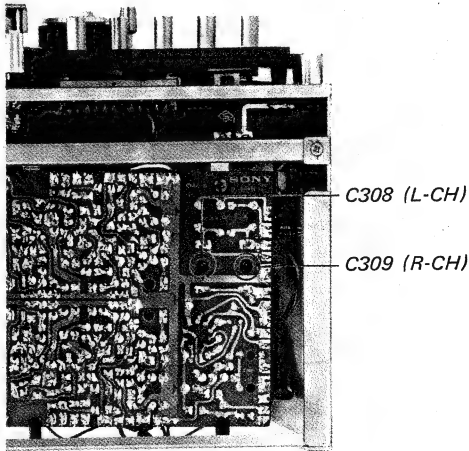
Procedure:

1. Mode: record
 1 kHz, -10 dB (0.25V)



Adjust	VTVM reading
C308 (L-CH) C309 (R-CH)	0.5 dB below the maximum (Turn the capacitor counter-clockwise from the maximum output position)

Adjustment Location:



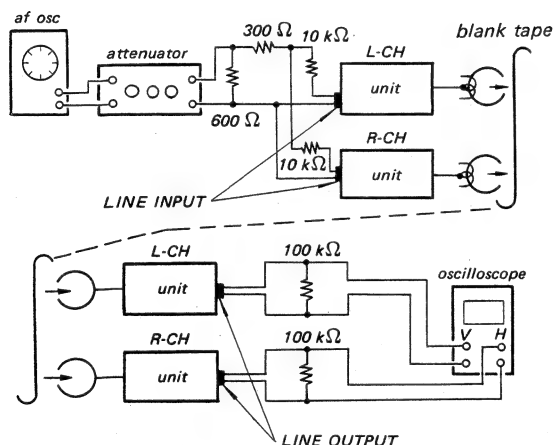
19. Overall Phase Check

Control/Switch/Setting:

MONITOR switch TAPE
 TAPE SELECT switch NORMAL
 REC MODE switch ON
 MIC ATT switch OFF
 TAPE SPEED switch 19 cm/s (7½ ips)
 LINE OUT VOL MAX
 LINE IN REC VOL For 0 dB (0.78V)
 (MONITOR switch: SOURCE) LINE OUT level
 (LINE OUT VOL: MAX) with 1 kHz,
 -10 dB (0.25V)
 LINE IN signal.

Procedure:

1. Mode: record
 1~10 kHz, -30 dB (24.5 mV)



Measure	on the oscilloscope
1 kHz	in phase
10 kHz	in phase ~ 45° ~ 90°

Note: If phase difference between L-CH and R-CH is more than 90°, finely adjust the record head azimuth adjusting screw.

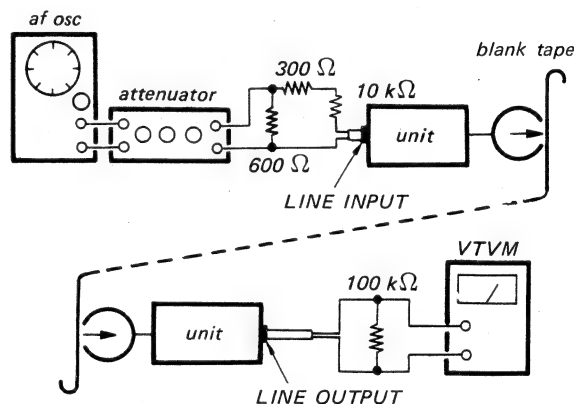
20. Record Level Adjustment

Control/Switch Setting:

MONITOR switch..... TAPE
 TAPE SELECT switch NORMAL
 REC MODE switch ON
 MIC ATT switch OFF
 TAPE SPEED switch 19 cm/s (7½ ips)
 LINE OUT VOL MAX
 LINE IN REC VOL For 0 dB (0.78V)
 (MONITOR switch: SOURCE) LINE OUT level
 (LINE OUT VOL: MAX) with 1 kHz,
 -10 dB (0.25V)
 LINE IN signal.

Procedure:

1. Mode: record
 1 kHz, -10 dB (0.25V)



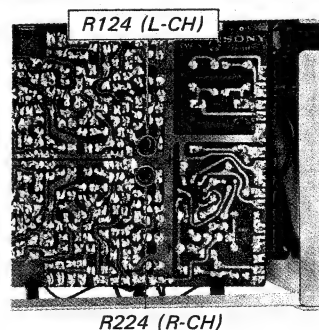
Adjust	VTVM reading
R124 (L-CH) R224 (R-CH)	0 dB (0.78V)

Note: allowance: within ±1 dB

Check:

Switch	VU meter reading
MONITOR switch: TAPE → SOURCE	within 2 dB difference
TAPE SPEED switch: 9.5 cm/s (3¾ ips)	within 2 dB between L-CH and R-CH
MONITOR switch: TAPE	

Adjustment Location:



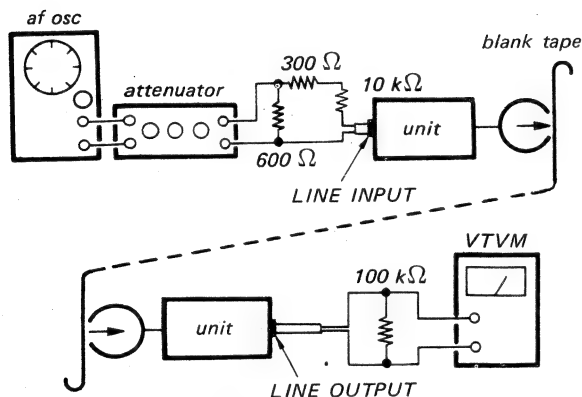
21. Dummy Coil Adjustment

Control/Switch Setting:

MONITOR switchTAPE
TAPE SELECT switch.... NORMAL
REC MODE switch ON (both channels)
MIC ATT switch..... OFF
TAPE SPEED switch 19 cm/s (7½ ips)
LINE OUT VOL MAX
LINE IN REC VOL For 0 dB (0.78V)
(MONITOR switch: SOURCE) LINE OUT level
(LINE OUT VOL: MAX) with 1 kHz,
-10 dB (0.25V)
LINE IN signal.

Procedure:

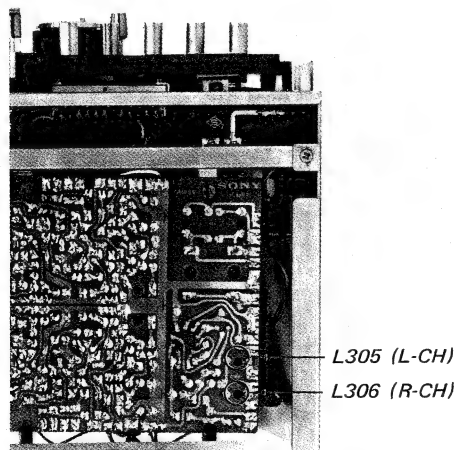
1. Mode: record
20 kHz, -30 dB (24.5mV)



REC MODE switch: ON → OFF	Adjust	LINE OUTPUT	VTVM reading
L-CH	L305	R-CH	no change
R-CH	L306	L-CH	no change

Note: allowance: within ±2 dB

Adjustment Location:



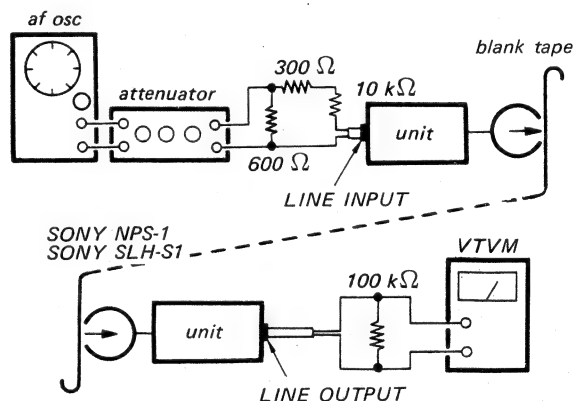
22. Overall Frequency Response Measurement

Control/Switch Setting:

MONITOR switch TAPE
TAPE SELECT switch.... NORMAL and SPECIAL
REC MODE switch OFF
MIC ATT switch OFF
TAPE SPEED switch 19 cm/s (7½ ips) and
9.5 cm/s (3¾ ips)
LINE OUT VOL MAX
LINE IN REC VOL For 0 dB (0.78V)
(MONITOR switch: SOURCE) LINE OUT level
(LINE OUT VOL: MAX) with 1 kHz,
-10 dB (0.25V)
LINE IN signal.

Procedure:

1. Mode: record
1 kHz
50 Hz
100 Hz
5 kHz
7 kHz
12.5 kHz
20 kHz
-30 dB (24.5 mV)



Specification:

TAPE SPEED	NPS-1 (TAPE SELECT switch: NORMAL)		SLH-S1 (TAPE SELECT switch: SPECIAL)	
	19 cm/s	9.5 cm/s	19 cm/s	9.5 cm/s
Playback				
1 kHz (for reference)	0 dB	0 dB	0 dB	0 dB
50 Hz	±3 dB	+3 -5 dB	±3 dB	+3 -6 dB
100 Hz	±3 dB	±3 dB	±3 dB	±3 dB
5 kHz	±3 dB	±3 dB	±3 dB	±3 dB
7 kHz	±3 dB	±3 dB	±3 dB	±3 dB
12.5 kHz	±3 dB	+3 -4 dB	±3 dB	±3 dB
20 kHz	+3 -4 dB	—	±3 dB	+3 -9 dB

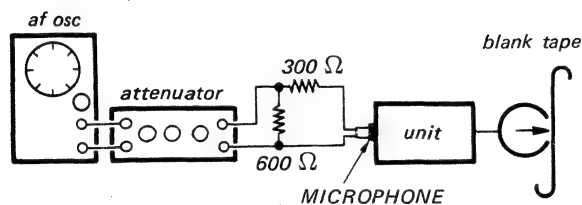
23. Overall Signal-to-Noise Ratio Measurement

Control/Switch Setting:

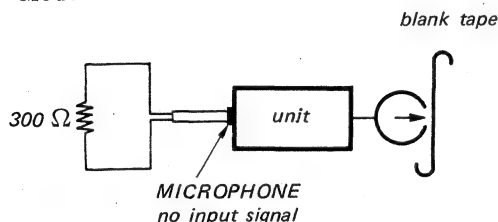
MONITOR switch TAPE
 TAPE SELECT switch..... NORMAL and SPECIAL
 REC MODE switch ON
 MIC ATT switch OFF
 TAPE SPEED switch 19 cm/s (7½ ips)
 LINE OUT VOL MAX
 MIC REC VOL For 0 dB (0.78V)
 (MONITOR switch: SOURCE) LINE OUT level
 (LINE OUT VOL: MAX) with 1 kHz,
 -60 dB (0.78 mV)
 MICROPHONE
 signal.

Procedure:

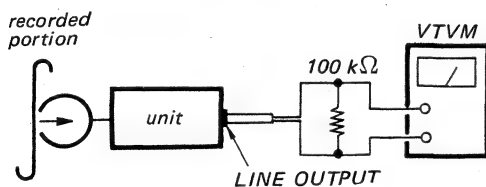
1. Mode: record
1 kHz, -60 dB (0.78 mV)



2. Mode: record



3. Mode: playback



Recorded Signal	VTVM reading	
	NORMAL (NPS-1)	SPECIAL (SLH-S1)
1 kHz	0dB (0.78V)	0dB (0.78V)
no signal	less than -45dB (4.4mV)	less than -47dB (3.5mV)

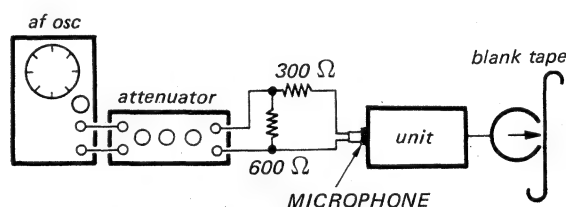
24. Overall Distortion Measurement

Control/Switch Setting:

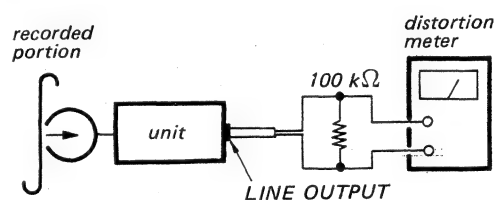
MONITOR switch TAPE
 TAPE SELECT switch NORMAL
 REC MODE switch ON
 MIC ATT switch OFF
 TAPE SPEED switch 19 cm/s (7½ ips)
 LINE OUT VOL MAX
 MIC REC VOL For 0 dB (0.78V)
 (MONITOR switch: SOURCE) LINE OUT level
 (LINE OUT VOL: MAX) with 1 kHz,
 -60 dB (0.78 mV)
 MICROPHONE
 signal.

Procedure:

1. Mode: record
1 kHz, -60 dB (0.78 mV)



2. Mode: playback



Specification: less than 1.5[%]

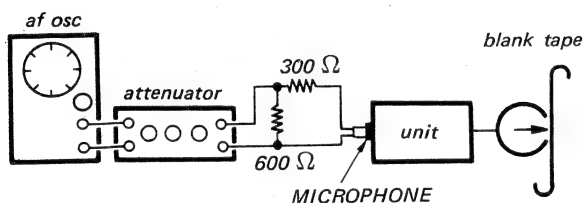
25. Erase Ratio Measurement

Control/Switch Setting:

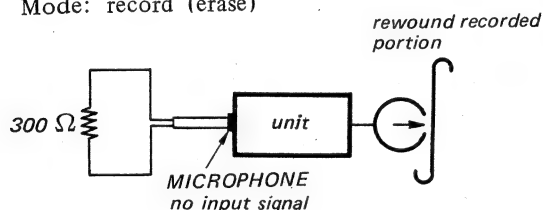
MONITOR switch TAPE
 TAPE SELECT switch NORMAL
 REC MODE switch ON
 MIC ATT switch OFF
 TAPE SPEED switch 19 cm/s (7½ ips)
 LINE OUT VOL MAX
 MIC REC VOL For 0 dB (0.78V)
 (MONITOR switch: SOURCE) LINE OUT level
 (LINE OUT VOL: MAX) with 1 kHz,
 -60 dB (0.78 mV)
 MICROPHONE
 signal.

Procedure:

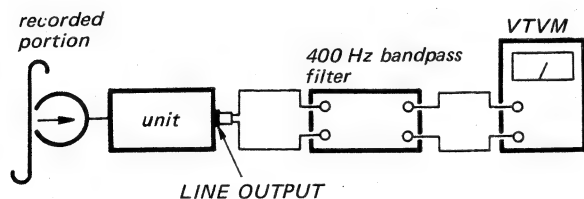
1. Mode: record
 400 Hz, -50 dB (2.45 mV)



2. Rewind half of the recorded portion.
3. Mode: record (erase)



4. Mode: playback



- Note:** 1. Use impedance-matching-free bandpass filter provided with buffer amplifier.
 2. When measuring without bandpass filter, compare unit (the same model) by hearing.

Specification:

Recorded Signal	VTVM reading
400 Hz	level difference
no signal	greater than 60 dB

26. Cross-talk Measurement (between channels)

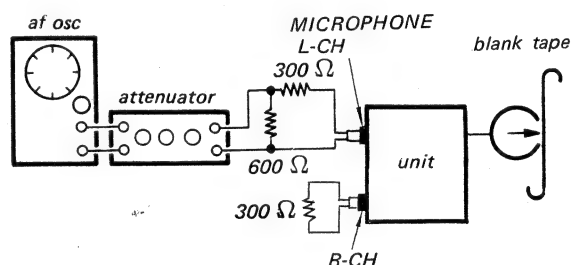
Control/Switch Setting:

MONITOR switch TAPE
 TAPE SELECT switch NORMAL
 REC MODE switch ON
 MIC ATT switch OFF
 TAPE SPEED switch 19 cm/s (7½ ips)
 LINE OUT VOL MAX
 MIC REC VOL For 0 dB (0.78V)
 (MONITOR switch: SOURCE) LINE OUT level
 (LINE OUT VOL: MAX) with 1 kHz,
 -60 dB (0.78 mV)
 MICROPHONE
 signal.

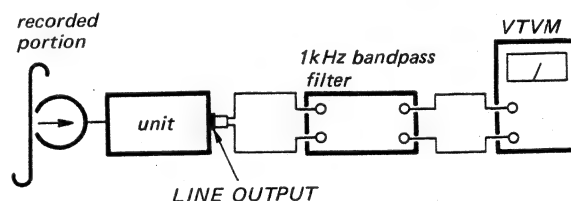
Procedure:

L-CH → R-CH

1. Mode: record
 1 kHz, -50 dB (2.45 mV)



2. Mode: playback



- Note:** 1. Use impedance-matching-free bandpass filter provided with buffer amplifier.
 2. When measuring without bandpass filter, compare with normal operating unit (the same model) by hearing.

LINE OUT	VTVM reading
L-CH	level difference
R-CH	greater than 48 dB

R-CH → L-CH

3. Terminate L-CH MICROPHONE jack with 300Ω resistor.
4. Supply 1 kHz, -50 dB (2.45 mV) signal to R-CH MICROPHONE jack.
5. Perform steps 1 and 2.

SECTION 4 DIAGRAMS

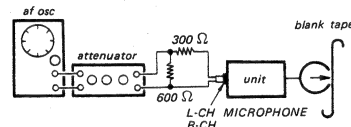
27. Cross-talk Measurement (between tracks)

Control/Switch Setting:

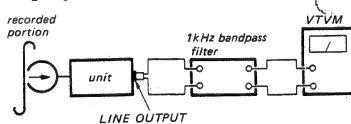
MONITOR switch TAPE
TAPE SELECT switch NORMAL
REC MODE switch ON
MIC ATT switch OFF
TAPE SPEED switch 19 cm/s (7½ ips)
LINE OUT VOL MAX
MIC REC VOL For 0 dB (0.78V)
(MONITOR switch: SOURCE) LINE OUT level
(LINE OUT VOL: MAX) with 1 kHz,
-60 dB (0.78 mV) MICROPHONE
signal.

Procedure:

- Mode: record
(1) 1 kHz, -50 dB (2.45 mV) both L-CH and R-CH MICROPHONE
- 1 kHz, -50 dB (2.45 mV) R-CH MICROPHONE only



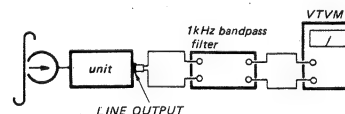
- Mode: playback



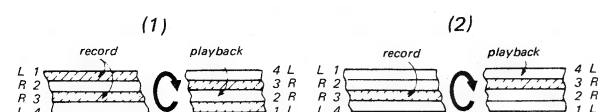
Note: 1. Use impedance-matching-free bandpass filter provided with buffer amplifier.
2. When measuring without bandpass filter, compare with normal operating unit (the same model) by hearing.

Memorize VTVM reading.

- Reverse the tape reels.
- Mode: playback
adjacent track of recorded track



Playback	VTVM reading
(1) R-CH	level difference from reading in step 2: greater than 60 dB
(2) L-CH	

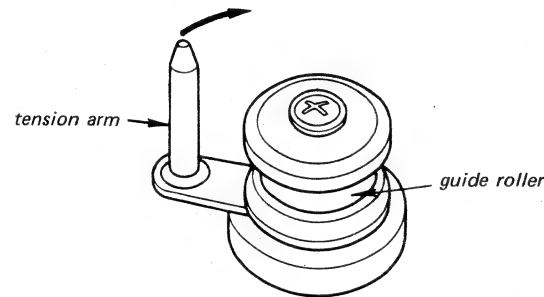


28. Wow and Flutter Measurement

Control/Switch Setting:

MONITOR switch TAPE
TAPE SELECT switch NORMAL
TAPE SPEED switch 19 cm/s (7½ ips) and
9.5 cm/s (3¾ ips)
LINE OUT VOL MAX

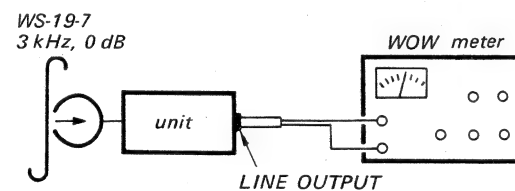
Move tension arm in the direction shown by the arrow.



Procedure:

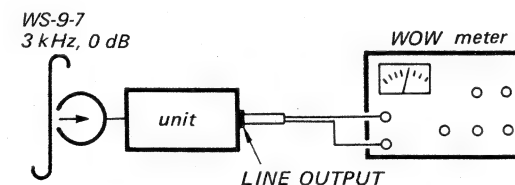
Note: Measure wow and flutter for beginning and end portion of tape.

- at 7½ ips (19 cm/s)
Mode: playback



Specification:
less than 0.11% (RMS)
less than 0.07% (RMS) weighted

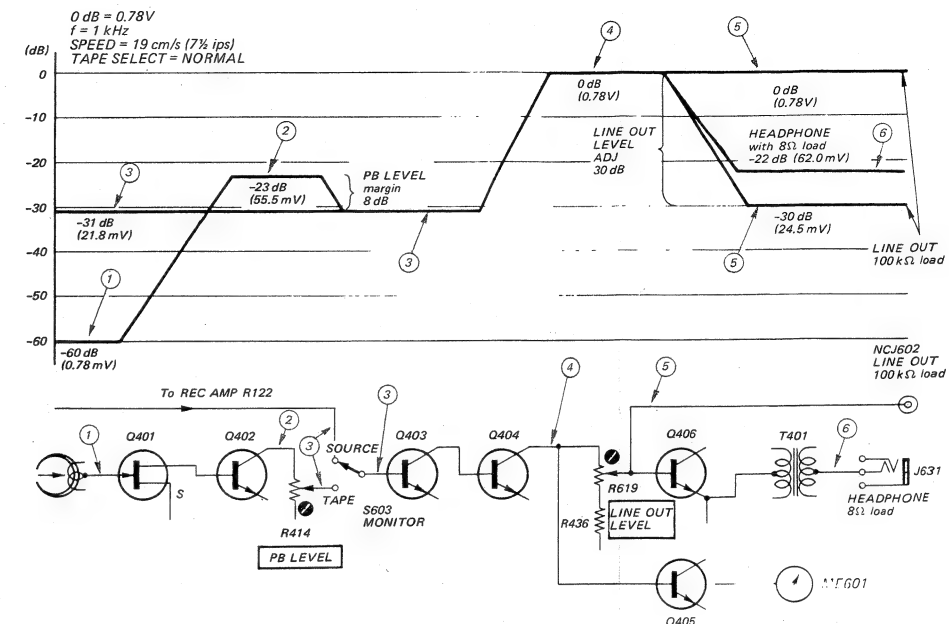
- at 3¾ ips (9.5 cm/s)
Mode: playback



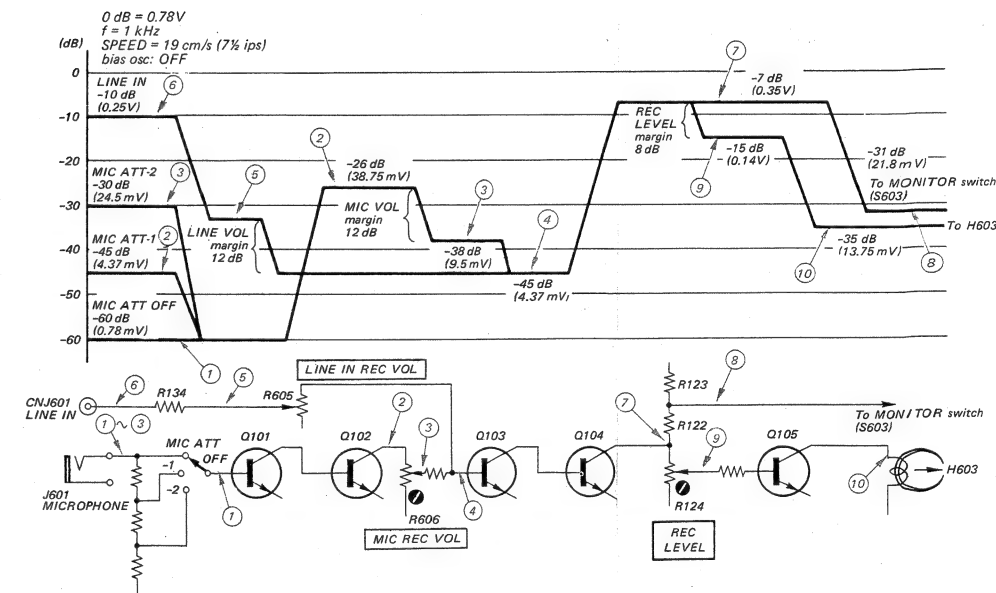
Specification:
less than 0.17% (RMS)
less than 0.11% (RMS) weighted

4-1. LEVEL DIAGRAM

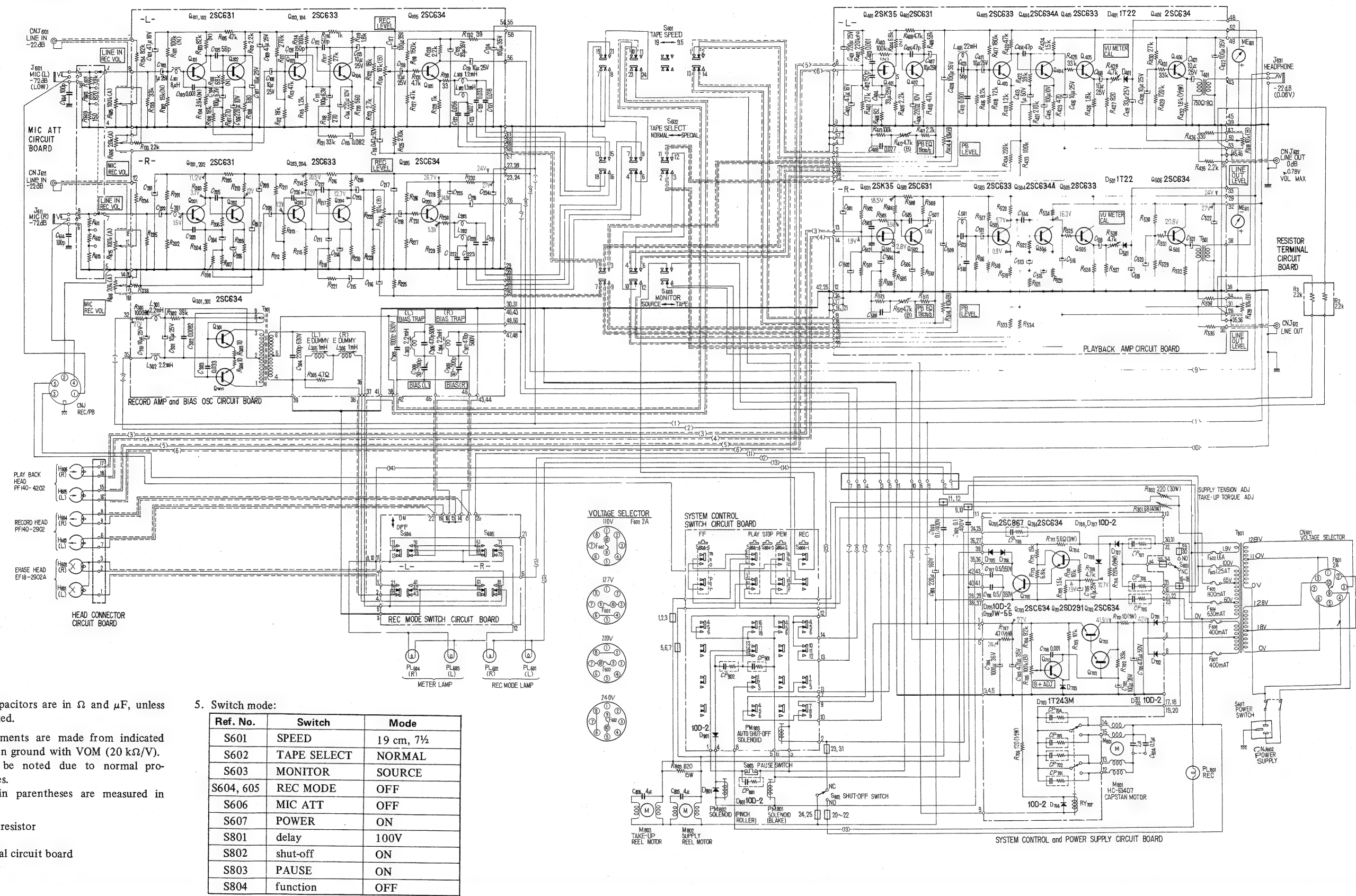
Playback



Record



4-2. SCHEMATIC DIAGRAM



- Note:**
1. Resistors and capacitors are in Ω and μF , unless otherwise indicated.
 2. Voltage measurements are made from indicated points to common ground with VOM (20 k Ω/V). Variations may be noted due to normal production tolerances. Voltage values in parentheses are measured in record mode.
 3. (N): low noise resistor
 4. AC terminal circuit board

5. Switch mode:

Ref. No.	Switch	Mode
S601	SPEED	19 cm, 7 1/2
S602	TAPE SELECT	NORMAL
S603	MONITOR	SOURCE
S604, 605	REC MODE	OFF
S606	MIC ATT	OFF
S607	POWER	ON
S801	delay	100V
S802	shut-off	ON
S803	PAUSE	ON
S804	function	OFF

4.3. MOUNTING DIAGRAM

Transistor Location

Q101 3D
Q102 3D
Q103 3E
Q104 3E
Q105 3F

Q201 4D
Q202 4D
Q203 4E
Q204 4E
Q205 4F

Q301 4G
Q302 4G

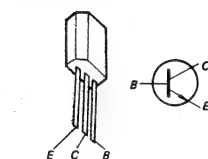
Q401 3M
Q402 3M
Q403 3O
Q404 3O
Q405 3P
Q406 2P

Q501 4M
Q502 4M
Q503 4O
Q504 4O
Q505 4P
Q506 5P

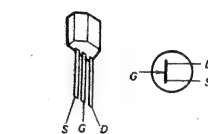
Q101, 201 }
Q102, 202 } 2SC631A
Q402, 502 }

Q103, 203 }
Q104, 204 } 2SC633A
Q403, 503 }
Q405, 505 }

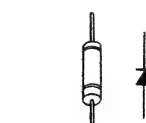
Q105, 205 }
Q301, 302 } 2SC634A
Q404, 504 }
Q406, 506 }



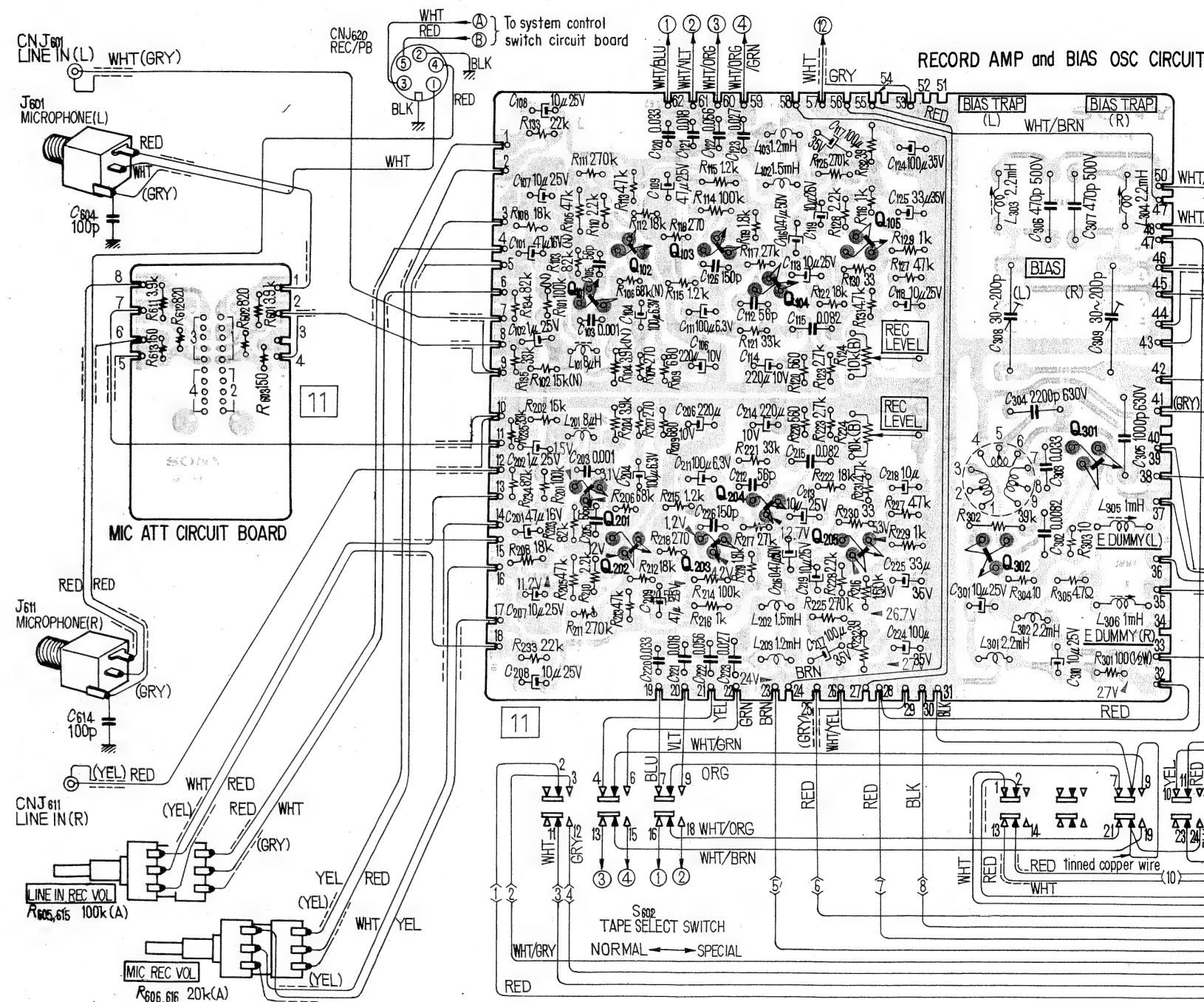
Q401, 501 2SK35



D401, 501 1T22



— Conductor Side —



4.3. MOUNTING DIAGRAM

Transistor Location

Q101 3D
Q102 3D
Q103 3E
Q104 3E
Q105 3F

Q201 4D
Q202 4D
Q203 4E
Q204 4E
Q205 4F

Q301 4G
Q302 4G

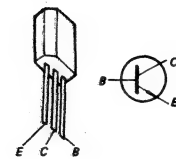
Q401 3M
Q402 3M
Q403 3O
Q404 3O
Q405 3P
Q406 2P

Q501 4M
Q502 4M
Q503 4O
Q504 4O
Q505 4P
Q506 5P

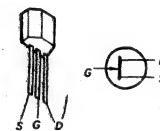
Q101, 201 } 2SC631A
Q102, 202 }
Q402, 502 }

Q103, 203 }
Q104, 204 } 2SC633A
Q403, 503 }
Q405, 505 }

Q105, 205 }
Q301, 302 } 2SC634A
Q404, 504 }
Q406, 506 }



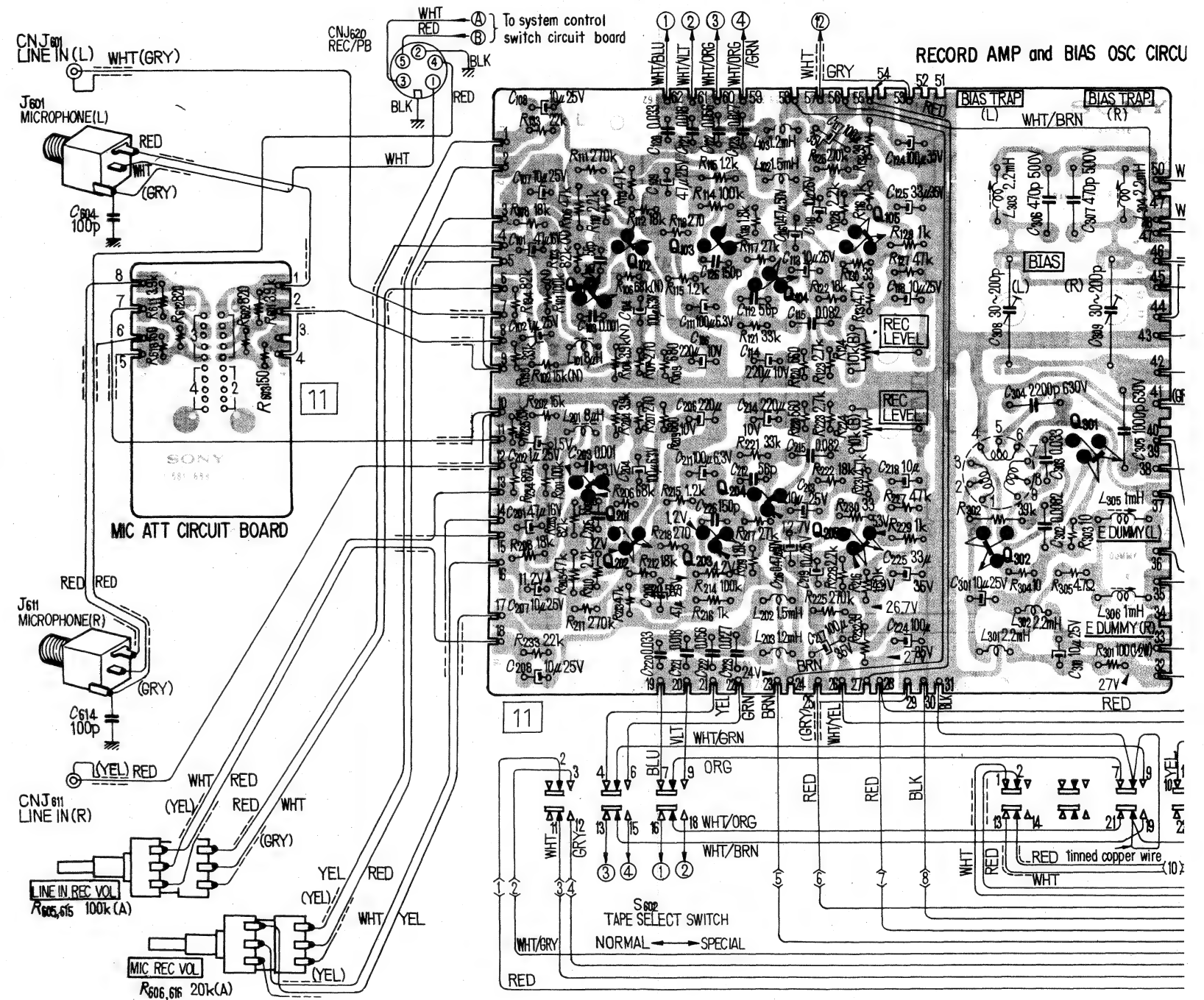
Q401, 501 - 2SK35



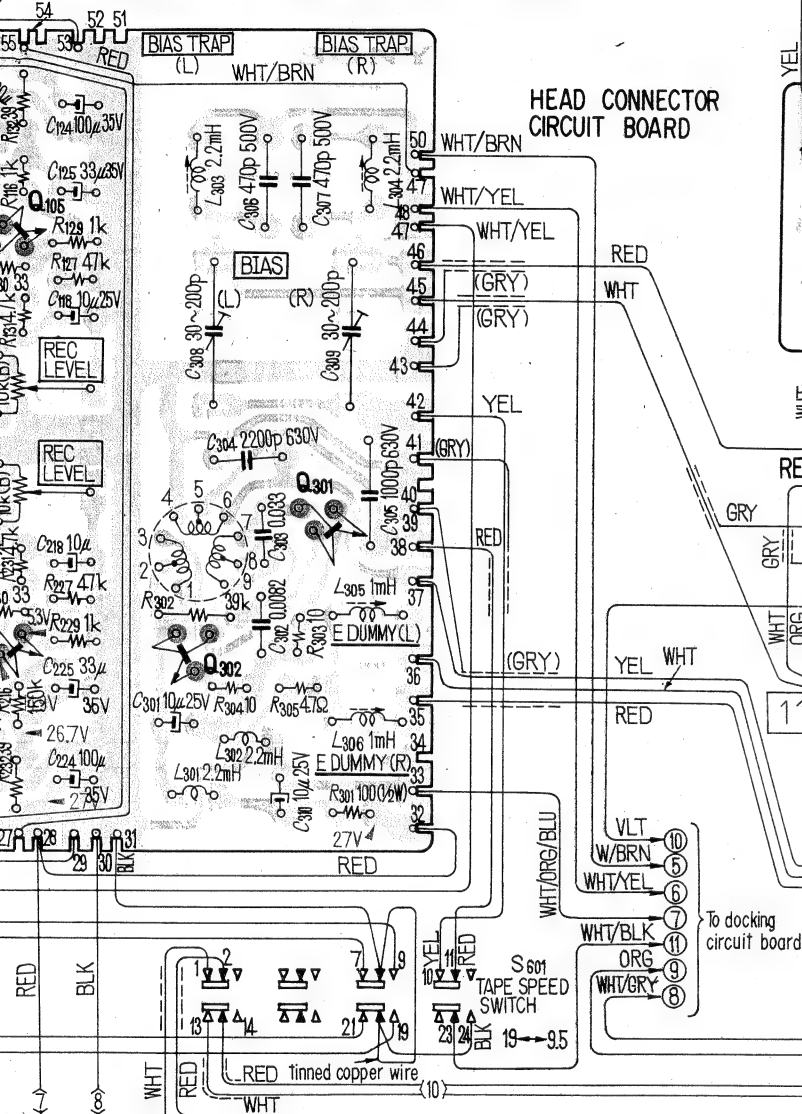
D401, 501 1T22



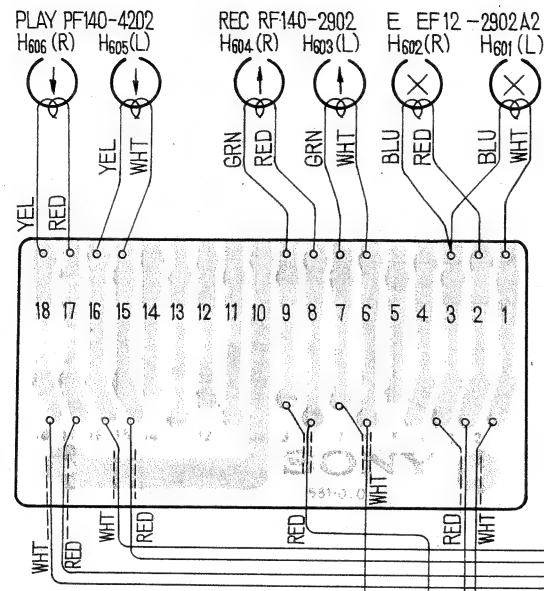
- Conductor Side -



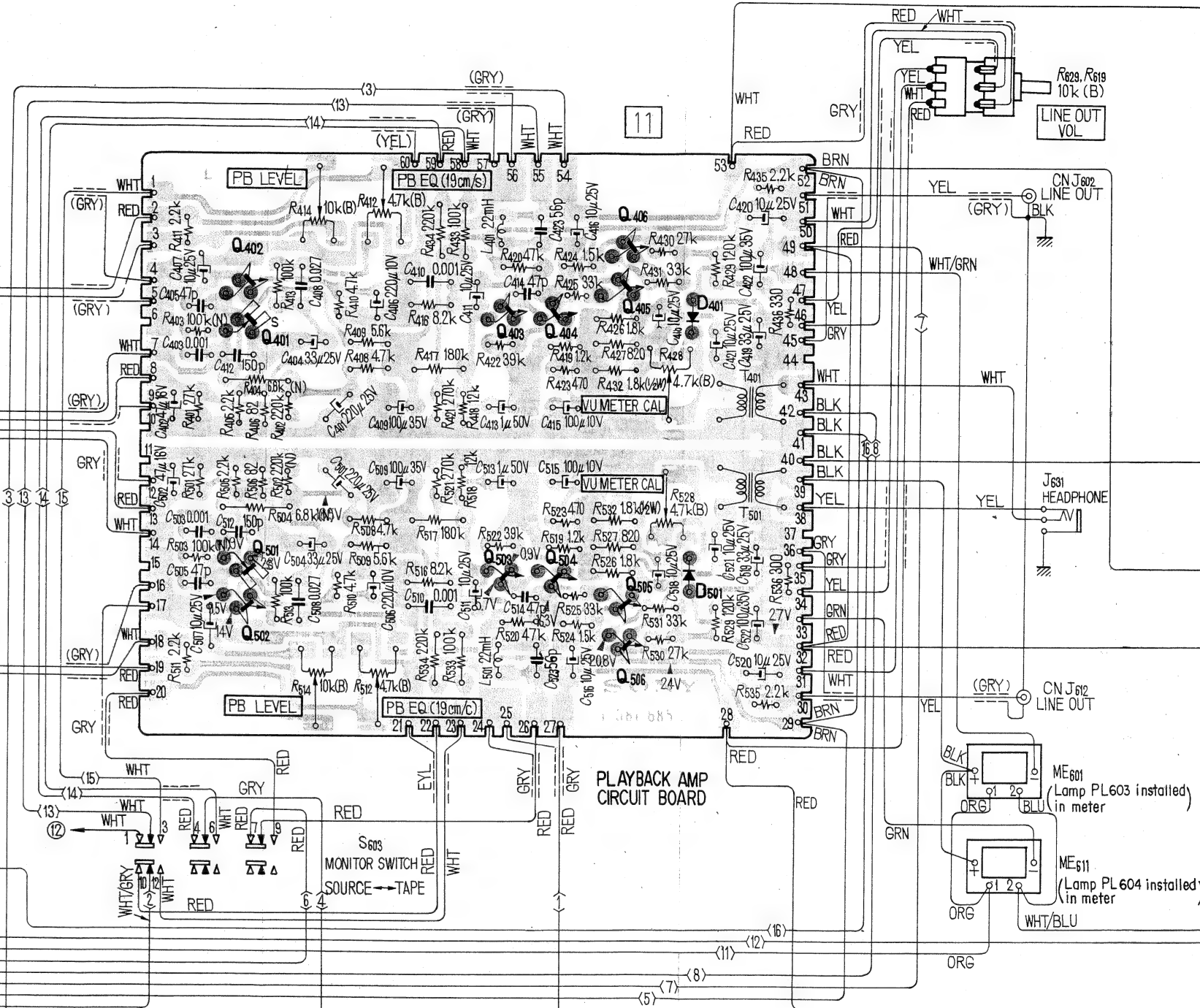
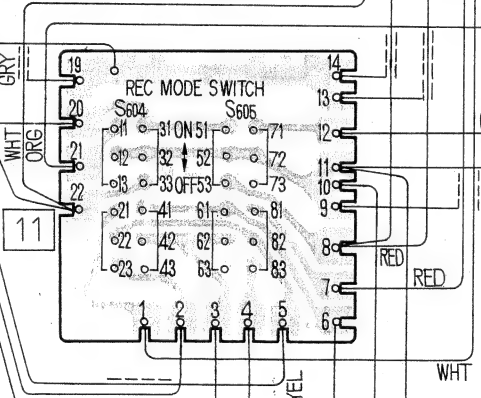
RECORD AMP and BIAS OSC CIRCUIT BOARD



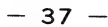
HEAD CONNECTOR CIRCUIT BOARD



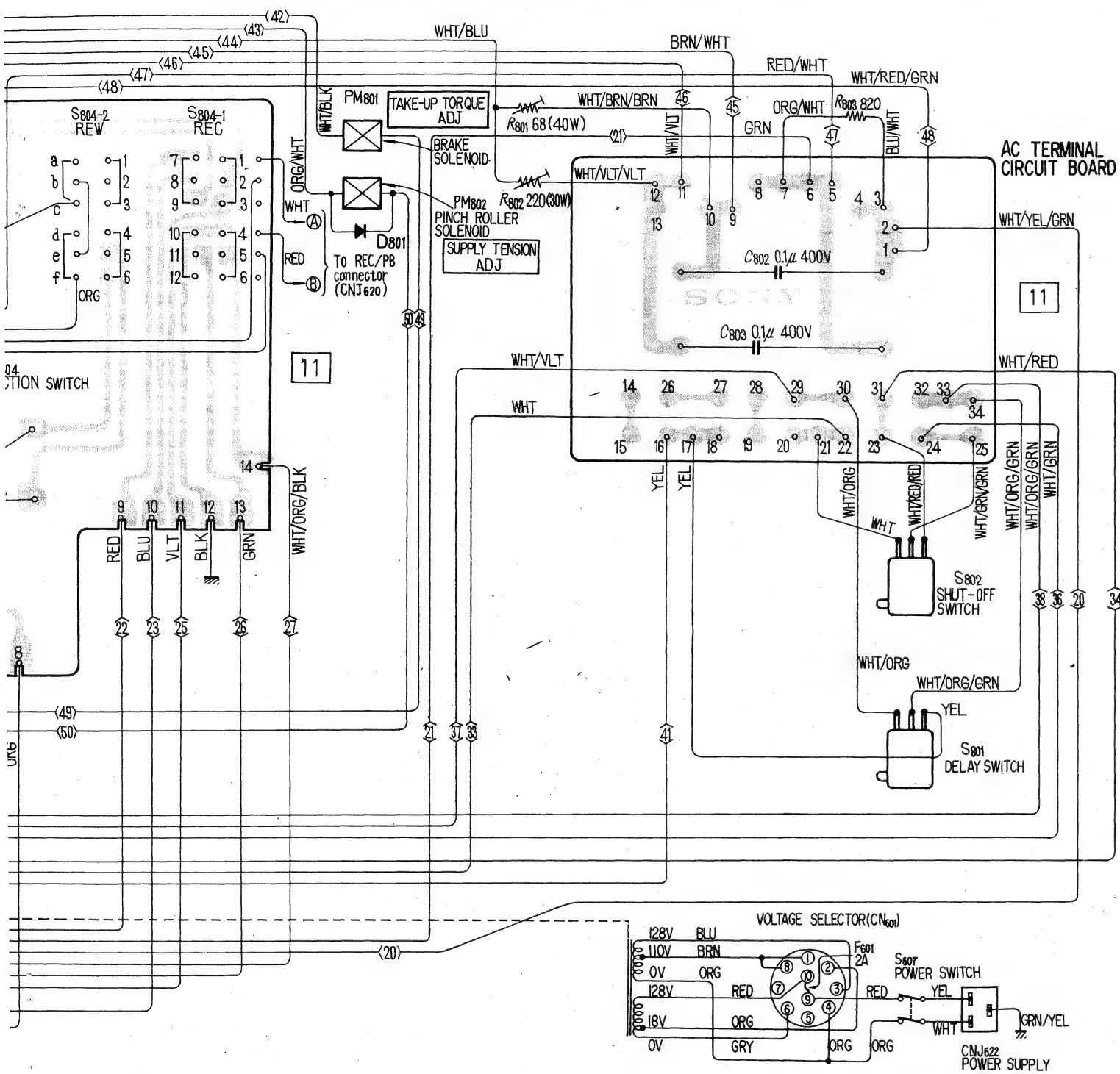
REC MODE CIRCUIT BOARD



PLAYBACK AMP CIRCUIT BOARD



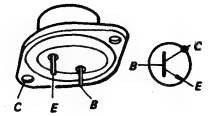




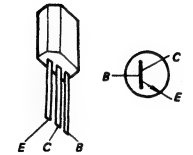
Transistor Location

Q701	3E
Q702	3D
Q703	2D
Q704	2F
Q705	2F

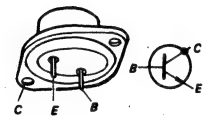
Q701 2SD291



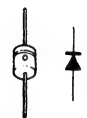
Q702, 703 } 2SC634A Q704



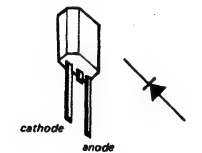
Q705 2SC867



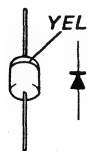
Q701, 702 } 10D-2 Q704, 705 Q707, 708 Q801, 901



D703 1T243



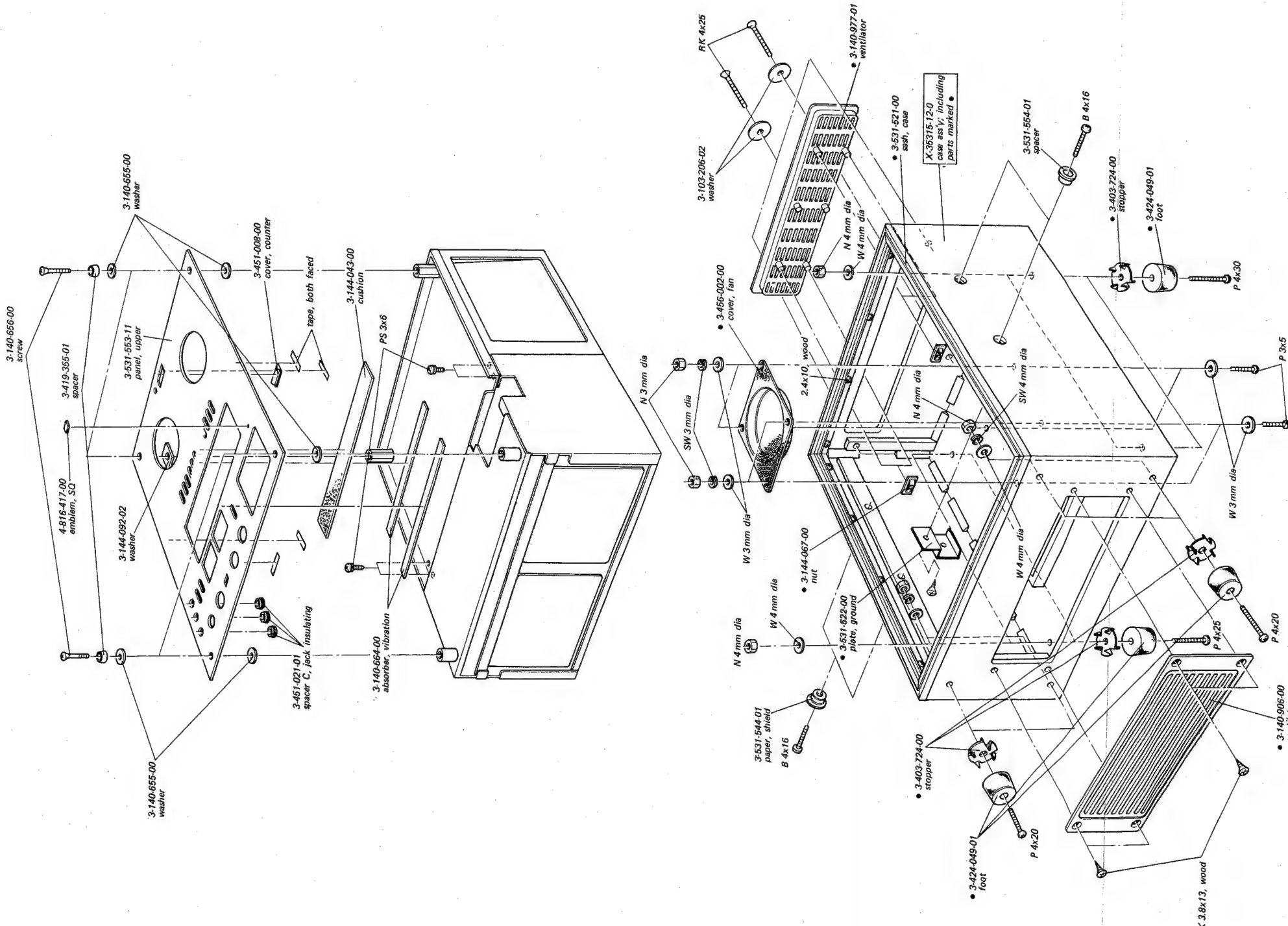
D706 SK-1W55



SECTION 5

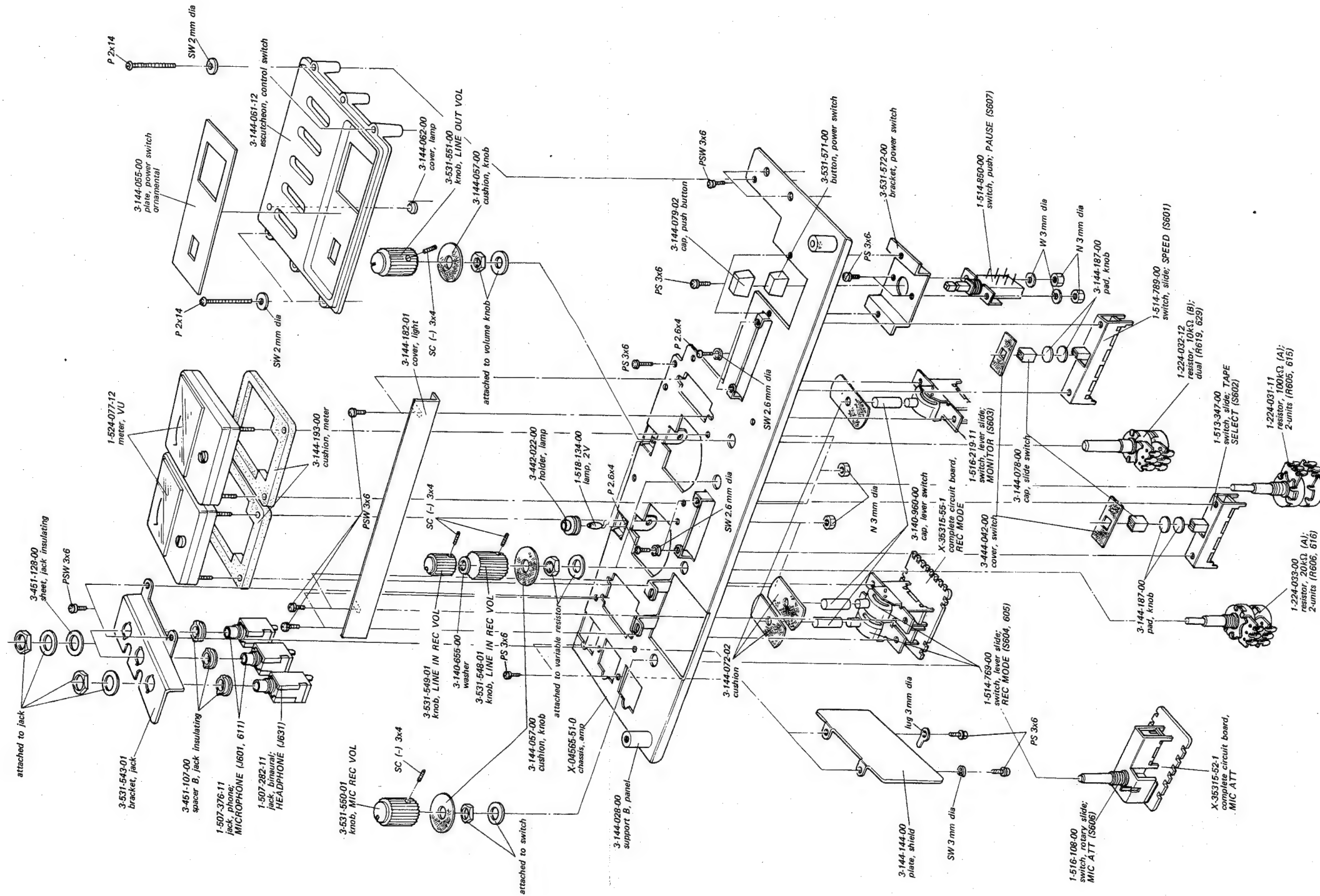
EXPLODED VIEWS

5-1. CABINET — top view —



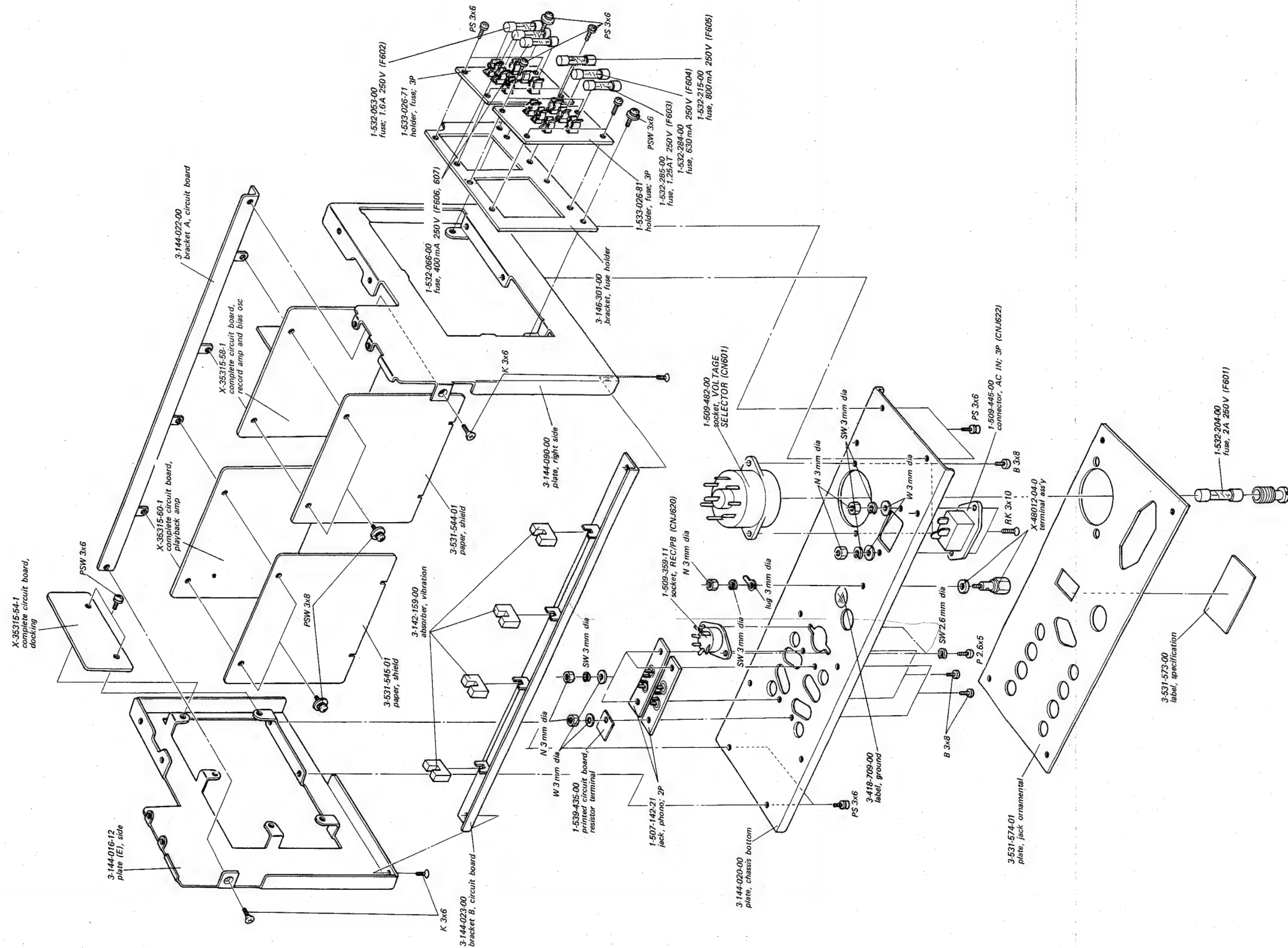
Note: 1. Parts without part numbers and names are not available.
2. All screws are Phillips type (cross recess type) unless otherwise indicated.
(-): slotted head

5-2 AMP CHASSIS — top view —



Note: 1. Parts without part numbers and names are not available.
2. All screws are Phillips type (cross recess type) unless otherwise indicated.
(-): slotted head

5-3. CIRCUIT BOARDS - top view -



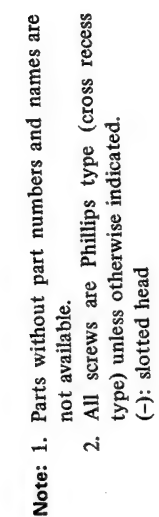
Note: 1. Parts without part numbers and names are not available.

not available.

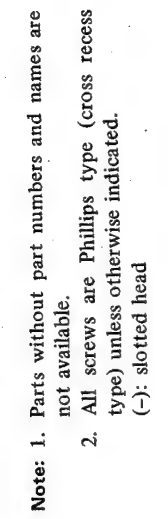
2. All screws are Phillips type (cross recess type) unless otherwise indicated.

(-): slotted head

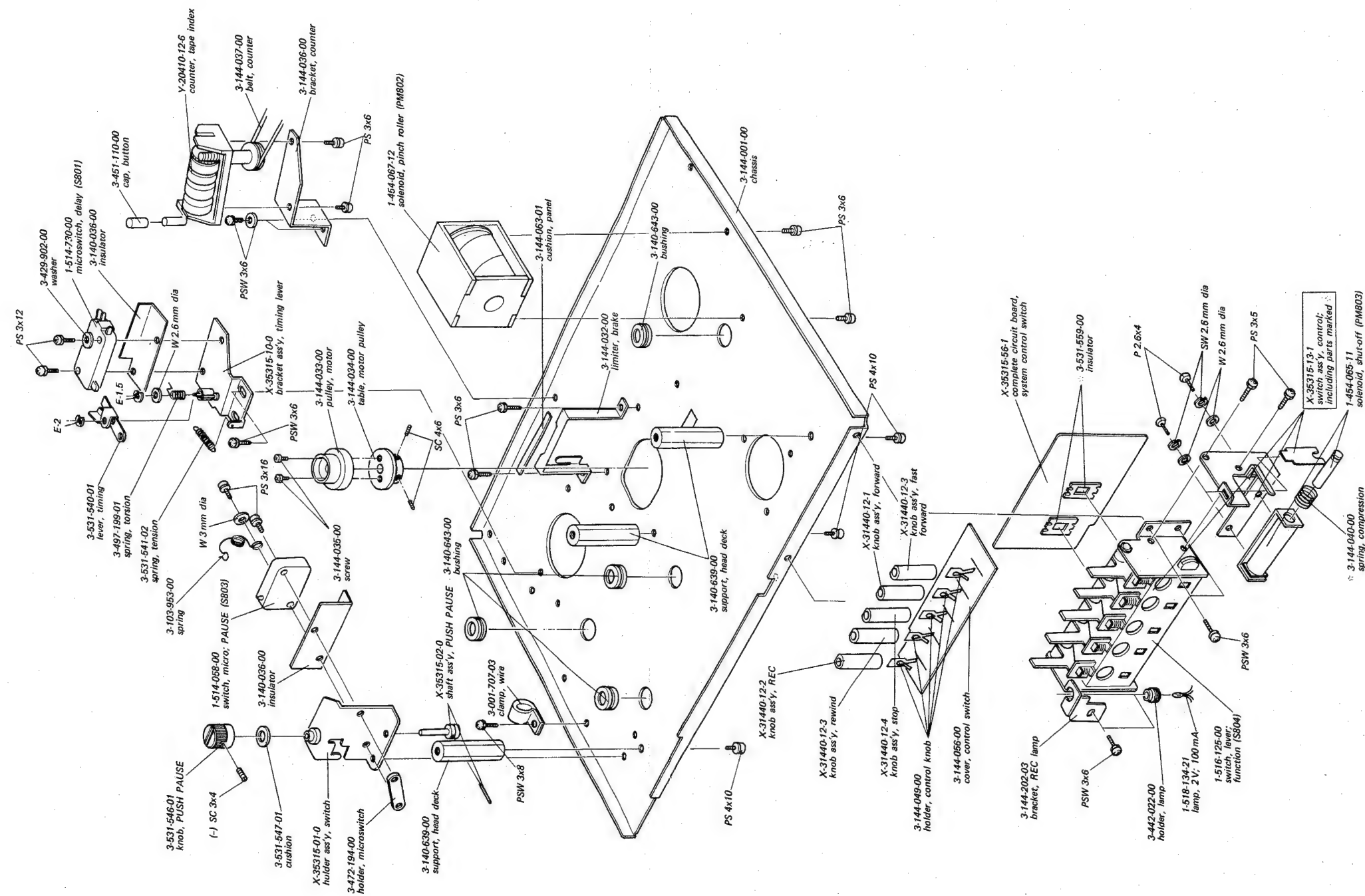
TC-640A TC-640A



TC-640A TC-640A

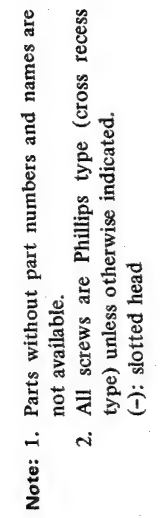


5-6. ELECTRICAL PARTS - bottom view -

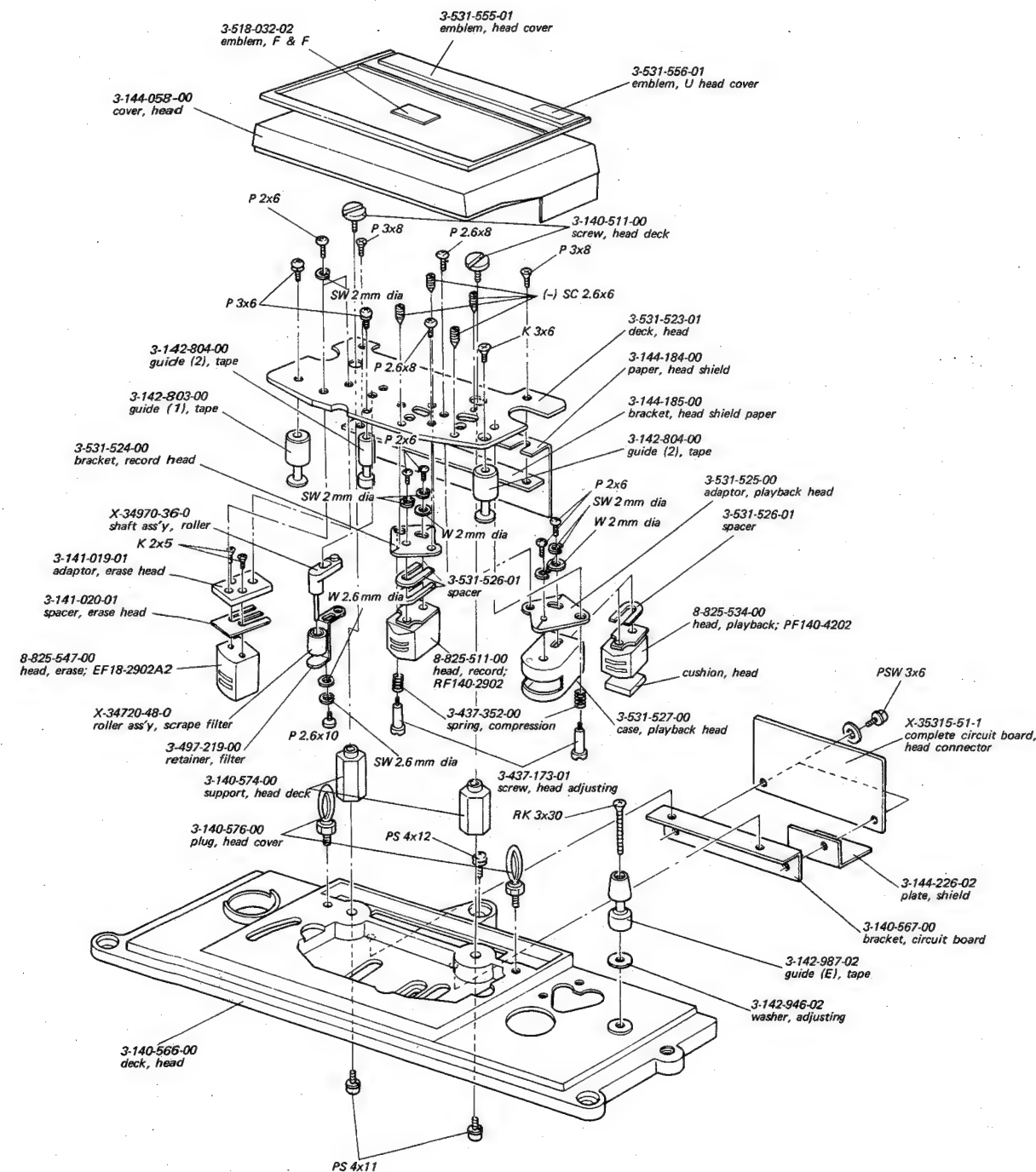


- Note: 1. Parts without part numbers and names are not available.
 2. All screws are Phillips type (cross recess type) unless otherwise indicated.
 (-): slotted head

TC-640A TC-640A

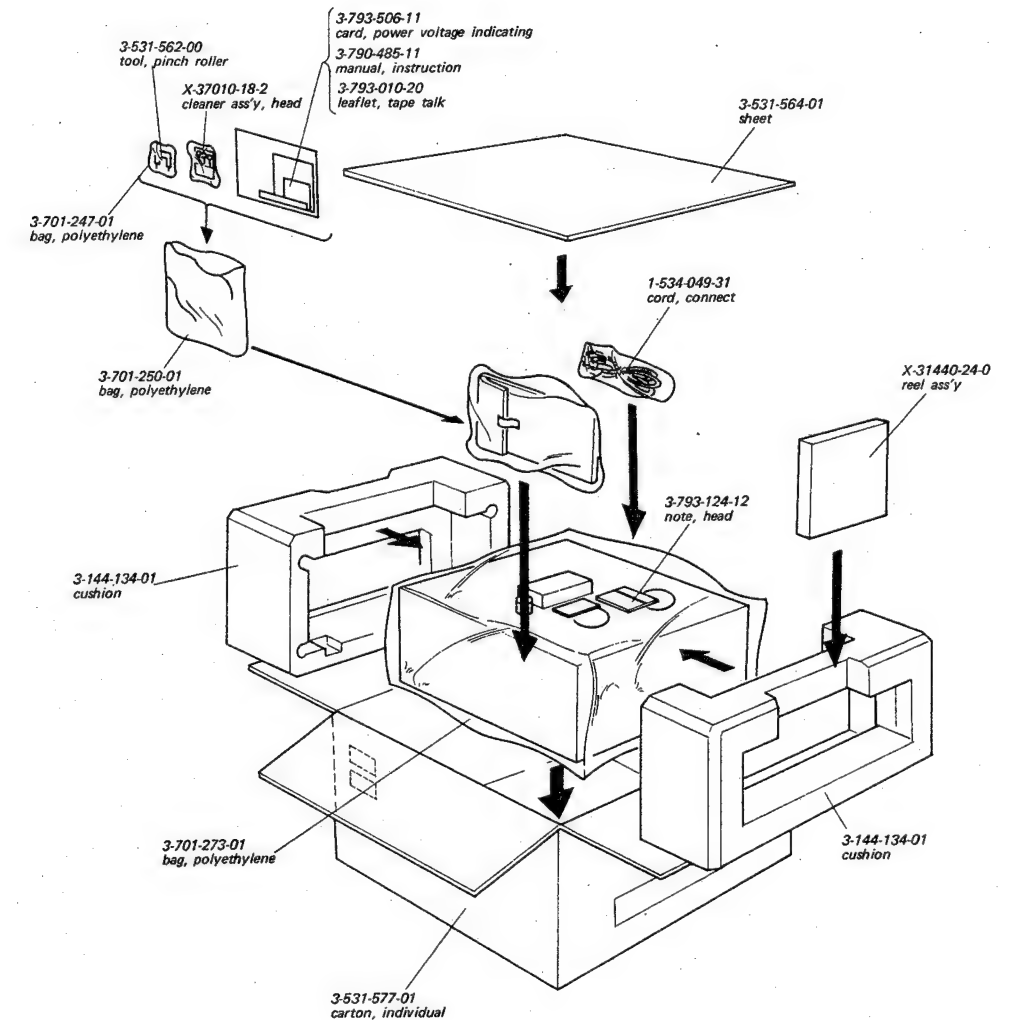


5-8. HEAD DECK (2)



- Note:** 1. Parts without part numbers and names are not available.
2. All screws are Phillips type (cross recess type) unless otherwise indicated.
- (-): slotted head

5-9. PACKING



- Note:** 1. Parts without part numbers and names are not available.

SECTION 6

ELECTRICAL PARTS LIST

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
COMPLETE CIRCUIT BOARDS					
	X-35315-51-1	head connector	L102, 202	1-407-494-21	micro inductor, 1.5 mH
	X-35315-52-1	MIC ATT	L103, 203	1-407-493-21	micro inductor, 1.2 mH
	X-35315-54-1	docking	L301	1-407-198-21	micro inductor, 2.2 mH
	X-35315-55-1	REC MODE	L302	1-407-198-21	micro inductor, 2.2 mH
	X-35315-56-1	system control switch	L303	1-407-286-11	variable inductor, 2.2 mH; BIAS TRAP ADJ (L-CH)
	X-35315-57-1	AC terminal	L304	1-407-286-11	variable inductor, 2.2 mH; BIAS TRAP ADJ (R-CH)
	X-35315-58-1	record amp and bias osc	L305	1-407-284-11	variable inductor, 1 mH; DUMMY COIL ADJ (L-CH)
	X-35315-59-1	system control and power supply	L306	1-407-284-11	variable inductor, 1 mH; DUMMY COIL ADJ (R-CH)
	X-35315-60-1	playback amp	L401, 501	1-407-210-21	micro inductor, 22 mH
SEMICONDUCTORS			TRANSFORMERS		
Q101, 201	transistor	2SC631A	T301	1-433-158-11	bias osc
Q102, 202	transistor	2SC631A	T401	1-427-270-11	headphone
Q103, 203	transistor	2SC633A	T501	1-427-270-11	headphone
Q104, 204	transistor	2SC633A	T801	1-442-013-11	power
Q105, 205	transistor	2SC634A	CAPACITORS		
Q301, 302	transistor	2SC634A	All capacitors are in μF unless otherwise indicated. (p = $\mu\mu$, elect = electrolytic)		
Q401, 501	transistor	2SK35			
Q402, 502	transistor	2SC631A	C101, 201	1-121-409-11	47 16 V elect
Q403, 503	transistor	2SC633A	C102, 202	1-127-094-11	1 25 V solid aluminum elect
Q404, 504	transistor	2SC634A	C103, 203	1-105-661-12	0.001 50 V mylar
Q405, 505	transistor	2SC633A	C104, 204	1-121-413-11	100 6.3 V elect
Q406, 506	transistor	2SC634A	C105, 205	1-107-125-11	56P 50 V silvered mica
Q701	transistor	2SD291	C106, 206	1-121-420-11	220 10 V elect
Q702	transistor	2SC634A	C107, 207	1-121-398-11	10 25 V elect
Q703	transistor	2SC634A	C108, 208	1-121-398-11	10 25 V elect
Q704	transistor	2SC634A	C109, 209	1-121-410-11	47 25 V elect
Q705	transistor	2SC867	C110, 210	-----	
D401, 501	diode	1T22	C111, 211	1-121-413-11	100 6.3 V elect
D701	diode	10D-2	C112, 212	1-107-125-11	56P 50 V silvered mica
D702	diode	10D-2	C113, 213	1-121-398-11	10 25 V elect
D703	diode	1T243	C114, 214	1-121-420-11	220 10 V elect
D704	diode	10D-2	C115, 215	1-105-684-12	0.082 50 V mylar
D705	diode	10D-2	C116, 216	1-121-726-11	0.47 50 V elect
D706	diode	SK-1W55	C117, 217	1-121-357-11	100 35 V elect
D707	diode	10D-2	C118, 218	1-121-398-11	10 25 V elect
D708	diode	10D-2	C119, 219	1-121-398-11	10 25 V elect
D801	diode	10D-2	C120, 220	1-105-519-12	0.033 50 V mylar
D901	diode	10D-2	C121, 221	1-105-516-12	0.018 50 V mylar
COILS					
L101, 201	1-407-519-11	inductor, 8 μH			

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>		<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	
C122, 222	1-105-522-12	0.056	50V mylar	C801	1-121-004-12	220	160V elect
C123, 223	1-105-518-12	0.027	50V mylar	C802	1-115-079-11	0.1	400V oil
C124, 224	1-121-357-11	100	35V elect	C803	1-115-079-11	0.1	400V oil
C125, 225	1-121-652-11	33	35V elect	C804	1-117-040-22	2+0.5	metalized paper
C126, 226	1-107-135-11	150P	50V silvered mica	C805	1-117-082-11	4	250V metalized paper
C301	1-121-738-11	10	50V elect	C806	1-117-082-11	4	250V metalized paper
C302	1-105-672-12	0.0082	50V mylar	RESISTORS			
C303	1-105-519-12	0.033	50V mylar				
C304	1-129-898-51	2,200P	630V polypropylene	All resistors are 1/4W, carbon type and in Ω unless otherwise indicated. (k = 1,000)			
C305	1-129-702-11	1,000P	630V polypropylene				
C306	1-107-185-11	470P	500V silvered mica	R2, 3	1-242-681-11	2.2k	
C307	1-107-185-11	470P	500V silvered mica	R101, 201	1-242-721-09	100k	low noise
C308	1-141-010-02	30~200P trimmer; BIAS ADJ (L-CH)		R102, 202	1-242-701-09	15k	low noise
C309	1-141-010-02	30~200P trimmer; BIAS ADJ (R-CH)		R103, 203	1-242-719-09	82k	low noise
C310	1-121-738-11	10	50V elect	R104, 204	1-242-687-09	3.9k	low noise
C401, 501	1-121-422-11	220	25V elect	R105, 205	1-242-713-11	47k	
C402, 502	1-121-409-11	47	16V elect	R106, 206	1-242-717-09	68k	low noise
C403, 503	1-105-661-12	0.001	50V mylar	R107, 207	1-242-659-11	270	
C404, 504	1-121-404-11	33	25V elect	R108, 208	1-242-703-11	18k	
C405, 505	1-107-123-11	47P	50V silvered mica	R109, 209	1-242-669-11	680	
C406, 506	1-121-420-11	220	10V elect	R110, 210	1-242-681-11	2.2k	
C407, 507	1-121-398-11	10	25V elect	R111, 211	1-242-731-11	270k	
C408, 508	1-105-518-12	0.027	50V mylar	R112, 212	1-242-703-11	18k	
C409, 509	1-121-357-11	100	35V elect	R113, 213	1-242-713-11	47k	
C410, 510	1-105-661-12	0.001	50V mylar	R114, 214	1-242-721-11	100k	
C411, 511	1-121-398-11	10	25V elect	R115, 215	1-242-675-11	1.2k	
C412, 512	1-107-135-11	150P	50V silvered mica	R116, 216	1-242-673-11	1k	
C413, 513	1-121-391-11	1	50V elect	R117, 217	1-242-707-11	27k	
C414, 514	1-107-123-11	47P	50V silvered mica	R118, 218	1-242-659-11	270	
C415, 515	1-121-414-11	100	10V elect	R119, 219	1-242-679-11	1.8k	
C416, 516	1-121-398-11	10	25V elect	R120, 220	1-242-667-11	560	
C417, 517		-----		R121, 221	1-242-709-11	33k	
C418, 518	1-121-398-11	10	25V elect	R122, 222	1-242-703-11	18k	
C419, 519	1-121-404-11	33	25V elect	R123, 223	1-242-683-11	2.7k	
C420, 520	1-121-398-11	10	25V elect	R124, 224	1-222-774-11	10k (B), adjustable; REC LEVEL	
C421, 521	1-121-398-11	10	25V elect	R125, 225	1-242-731-11	270k	
C422, 522	1-121-357-11	100	35V elect	R126, 226	1-242-725-11	150k	
C423, 523	1-107-125-11	56P	50V silvered mica	R127, 227	1-242-713-11	47k	
C604, 614	1-107-131-11	100P	50V silvered mica	R128, 228	1-242-681-11	2.2k	
C701	1-121-810-11	470	50V elect	R129, 229	1-242-673-11	1k	
C702	1-121-357-11	100	35V elect	R130, 230	1-242-637-11	33	
C703	1-121-361-11	470	35V elect	R131, 231	1-242-689-11	4.7k	
C704	1-121-388-11	1,000	35V elect	R132, 232	1-242-639-11	39	
C705	1-121-961-11	4.7	25V elect	R133, 233	1-242-705-11	22k	
C706	1-117-054-11	0.5	350V metalized paper	R134, 234	1-242-719-11	82k	
C707	1-117-054-11	0.5	350V metalized paper	R135, 235	1-242-709-11	33k	
C708	1-105-661-12	0.001	50V mylar				

TC-640A TC-640A

Ref. No.	Part No.	Description
R301	1-244-849-11	100 ½W
R302	1-242-711-11	39k
R303	1-242-625-11	10
R304	1-242-625-11	10
R305	1-242-617-11	4.7
R401, 501	1-242-707-09	27k low noise
R402, 502	1-242-729-09	220k low noise
R403, 503	1-242-721-09	100k low noise
R404, 504	1-242-693-09	6.8k low noise
R405, 505	1-242-681-11	2.2k
R406, 506	1-242-647-11	82
R407, 507		-----
R408, 508	1-242-689-11	4.7k
R409, 509	1-242-691-11	5.6k
R410, 510	1-242-689-11	4.7k
R411, 511	1-242-681-11	2.2k
R412, 512	1-222-773-11	4.7k (B), adjustable; PB EQ (19 cm/s) ADJ
R413, 513	1-242-721-11	100k
R414, 514	1-222-774-11	10k (B), adjustable; PB LEVEL ADJ
R415, 515		-----
R416, 516	1-242-695-11	8.2k
R417, 517	1-242-727-11	180k
R418, 518	1-242-699-11	12k
R419, 519	1-242-675-11	1.2k
R420, 520	1-242-713-11	47k
R421, 521	1-242-731-11	270k
R422, 522	1-242-711-11	39k
R423, 523	1-242-665-11	470
R424, 524	1-242-677-11	1.5k
R425, 525	1-242-709-11	33k
R426, 526	1-242-679-11	1.8k
R427, 527	1-242-671-11	820
R428, 528	1-222-773-11	4.7k (B), adjustable; VU METER CAL
R429, 529	1-242-723-11	120k
R430, 530	1-242-707-11	27k
R431, 531	1-242-709-11	33k
R432, 532	1-244-879-11	1.8k ½W
R433, 533	1-242-721-11	100k
R434, 534	1-242-729-11	220k
R435, 535	1-242-681-11	2.2k
R436, 536	1-242-661-11	330
R601, 611	1-242-687-11	3.9k
R602, 612	1-242-671-11	820
R603, 613	1-242-653-11	150
R604, 614		-----
R605, 615	1-224-031-11	100k (A), 2-units; LINE IN REC VOL
R606, 616	1-224-033-11	20k (A), 2-units; MIC REC VOL
R619, 629	1-224-032-12	10k (B), dual; LINE OUT VOL

Ref. No.	Part No.	Description
R701	1-206-069-11	10 1W metal oxide
R702	1-242-709-11	33k
R703	1-242-697-11	10k
R704	1-242-719-11	82k
R705	1-222-777-11	100k (B), adjustable; B+ ADJ
R706	1-244-851-11	120 ½W
R707	1-244-841-11	47 ½W
R708	1-202-589-31	4.7k ½W composition
R709	1-242-677-11	1.5k
R710	1-242-697-11	10k
R711	1-207-654-11	5.6 3W wire wound
R712	1-206-012-11	15k 2W metal oxide
R713	1-242-693-11	6.8k
R714	1-244-923-31	120k ½W
R801	1-205-503-22	68 40W wire wound (TAKE-UP TORQUE ADJ)
R802	1-205-518-22	220 30W wire wound (SUPPLY TENSION ADJ)
R803	1-217-175-11	820 15W wire wound
SWITCHES		
S601	1-514-789-00	slide, SPEED
S602	1-513-347-00	slide, TAPE SELECT
S603	1-516-219-11	lever slide, MONITOR
S604, 605	1-514-769-00	lever slide, REC MODE
S606	1-516-108-00	rotary slide, MIC ATT
S607	1-514-850-00	push, POWER
S801	1-514-730-00	micro, delay
S802	1-514-730-00	micro, shut-off
S803	1-514-058-00	micro, PAUSE
S804	1-516-125-00	lever, function
JACKS		
J601, 611	1-507-376-11	phone, MICROPHONE
J631	1-507-282-11	binaural, HEADPHONE
CNJ601,611	1-507-142-21	phono, LINE INPUT
CNJ602,612	1-507-142-21	phono, LINE OUTPUT
CNJ620	1-509-359-11	socket, REC/PB
CNJ622	1-509-445-00	3P, AC IN
CNP623	1-506-339-11	connector, 2P
CN601	1-509-482-00	socket, VOLTAGE SELECTOR
HEADS		
RH603, 604	8-825-511-00	record (RF140-2902)

Ref. No.	Part No.	Description
PH605,607	8-825-534-00	playback (PF140-4202)
EH601,602	8-825-547-00	erase (EF18-2902A2)
SOLENOIDS		
PM801	1-454-066-11	brake
PM802	1-454-067-12	pinch roller
PM803	1-454-065-11	shut-off
MOTORS		
M801	8-831-634-21	capstan (HC-634D7)
M802	8-836-624-07	supply reel (UC-624K)
M803	8-836-624-07	take-up reel (UC-624K)
FUSES		
F601	1-532-204-00	2A, 250V
F602	1-532-053-00	1.6A, 250V
F603	1-532-285-00	1.25AT, 250V
F604	1-532-284-00	630 mA, 250V

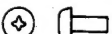

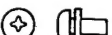




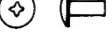
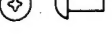
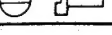
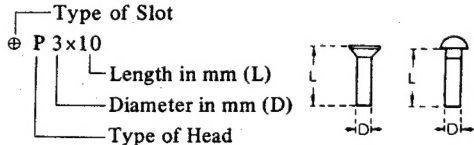
Ref. No.	Part No.	Description
F605	1-532-215-00	800 mA, 250V
F606	1-532-066-00	400 mA, 250V
F607	1-532-066-00	400 mA, 250V
ENCAPSULATED COMPONENTS		
CP1 ~8	1-101-534-12	0.1 μF + 120 Ω
CP801	1-101-534-12	0.1 μF + 120 Ω
CP901,902	1-101-534-12	0.1 μF + 120 Ω
MISCELLANEOUS		
ME601,611	1-524-077-12	meter, VU
	1-539-435-00	printed circuit board, resistor terminal
PL601,602	1-518-134-21	lamp, 2V 100 mA
PL801	1-518-134-21	lamp, 2V 100 mA
RY701	1-515-127-41	relay
	1-533-026-71	holder, fuse; 3P
	1-533-026-81	holder, fuse; 3P
	1-535-045-11	terminal, circuit board lead
	1-535-506-21	terminal, solderless
	1-536-147-11	terminal strip, 1L2A type

SECTION 7 HARDWARE

All screws are Phillips type (cross recess type) unless otherwise indicated.
(-): slotted head

Part No.	Description	Part No.	Description
SCREWS			
7-621-770-88	B 2.6 x 6	7-682-663-02	PS 4 x 12
7-621-842-39	RK 2.7 x 10, wood	7-683-127-31	2 x 4, set; hexagon socket
7-682-124-02	P 2 x 4	7-683-138-31	3 x 4, set; hexagon socket
7-682-126-02	P 2 x 6	7-683-247-31	4 x 6, set; hexagon socket
7-682-130-02	P 2 x 14	WASHERS	
7-682-147-04	P 3 x 6	7-623-105-24	2 mm dia
7-682-152-02	P 3 x 16	7-623-107-24	2.6 mm dia
7-682-166-02	P 4 x 30	7-623-108-04	3 mm dia (small)
7-682-168-02	P 4 x 20	7-623-108-24	3 mm dia
7-682-225-02	K 2 x 5	7-623-110-24	4 mm dia
7-682-226-02	K 2 x 6	7-623-205-21	2 mm dia, spring
7-682-247-02	K 3 x 6	7-623-207-21	2.6 mm dia
7-682-248-02	K 3 x 8	7-623-208-21	3 mm dia
7-682-259-33	P 2.6 x 5	7-623-210-21	4 mm dia
7-682-348-04	RK 3 x 8	RETAINING RINGS	
7-682-355-04	RK 3 x 30	7-624-106-01	E-3
7-682-367-04	RK 4 x 25	7-624-108-01	E-4
7-682-526-02	B 2 x 6	7-624-109-01	E-5
7-682-547-05	B 3 x 6	7-624-110-01	E-6
7-682-548-05	B 3 x 8	NUTS	
7-682-565-05	B 4 x 16	7-684-013-02	3 mm dia
7-682-645-02	PS 3 x 4	7-684-014-02	4 mm dia
7-682-647-02	PS 3 x 6	COTTER PIN	
7-682-649-02	PS 3 x 10	7-626-202-31	1 x 10
7-682-650-02	PS 3 x 12		
7-682-651-02	PS 3 x 14		
7-682-662-02	PS 4 x 10		

— Hardware Nomenclature —

P — Pan Head Screw		SC — Set Screw	
PS — Pan Head Screw with Spring Washer		E — Retaining Ring (E Washer)	
K — Flat Countersunk Head Screw		W — Washer	
B — Binding Head Screw		SW — Spring Washer	
RK — Oval Countersunk Head Screw		LW — Lock Washer	
T — Truss Head Screw		N — Nut	
R — Round Head Screw		— Example —	
F — Flat Fillister Head Screw			

SONY CORPORATION

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